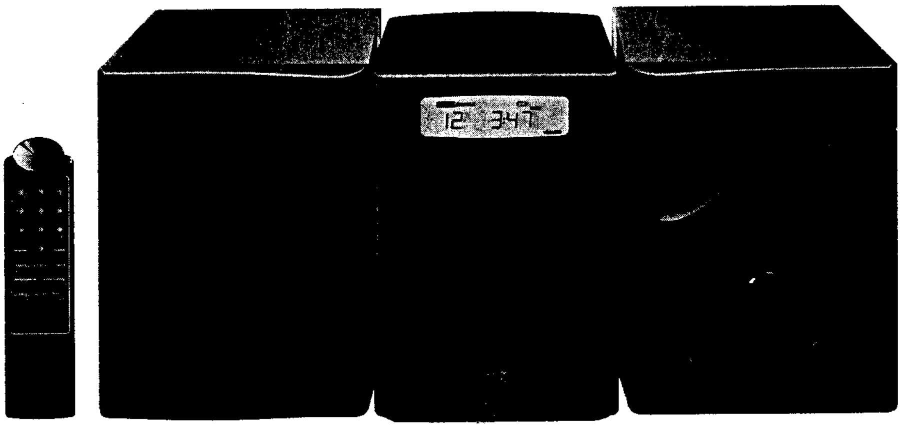
Micro System FW17/20/21/21M/22/25

Service
Service
Service



Service Manual

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PCS 64 309

PHILIPS

SPECIFICATIONS

GENERAL

Mains voltage/setting	:	220-230V for -/20/22 230-240V for -/25 Switchable 110-127 / 220-240V for -/21/21M
Mains frequency	:	50Hz/60Hz
Mains breakdown protection	:	10 minutes
Clock Accuracy	:	<4 sec/day
Power consumption	:	90W max.
Dimension centre unit	:	160 x 228 x 285mm

TUNER : FM SECTION

Tuning range	:	87.5MHz - 108MHz
IF frequency	:	10.7MHz
Aerial input	:	75Ω coaxial
Sensitivity at 26dB S/N	:	< 7µV {3.5µV}
Selectivity at 600kHz bandwidth	:	> 20dB {45dB}
IF rejection	:	> 50dB {80dB}
image rejection	:	> 20dB {72dB}

TUNER : AM SECTION

Tuning range	MW	:	522kHz - 1611kHz
	LW	:	153kHz - 279kHz
IF frequency		:	450kHz
Sensitivity at 26dB S/N	MW	:	< 4.0mV/M {4.0mV/m}
	LW	:	< 6.0mV/M {7.5mV/m}
Selectivity at 18kHz bandwidth	MW	:	> 16dB {30dB}
	LW	:	> 20dB {30dB}
IF rejection	MW	:	> 24dB {24dB}
	LW	:	> 26dB {26dB}
Image rejection	MW	:	> 28dB {28dB}
	LW	:	> 30dB {30dB}

AMPLIFIER

Output power		:	2 x 45W
Speaker impedance		:	2 x 6Ω L/R
Frequency response within -3dB		:	63Hz - 15kHz
DBB control		:	10dB ± 2dB at 70Hz - 90Hz
Headphone output at 32Ω		:	25mW
Input sensitivity	Aux/TV	:	400mV at 47kΩ

CASSETTE RECORDER

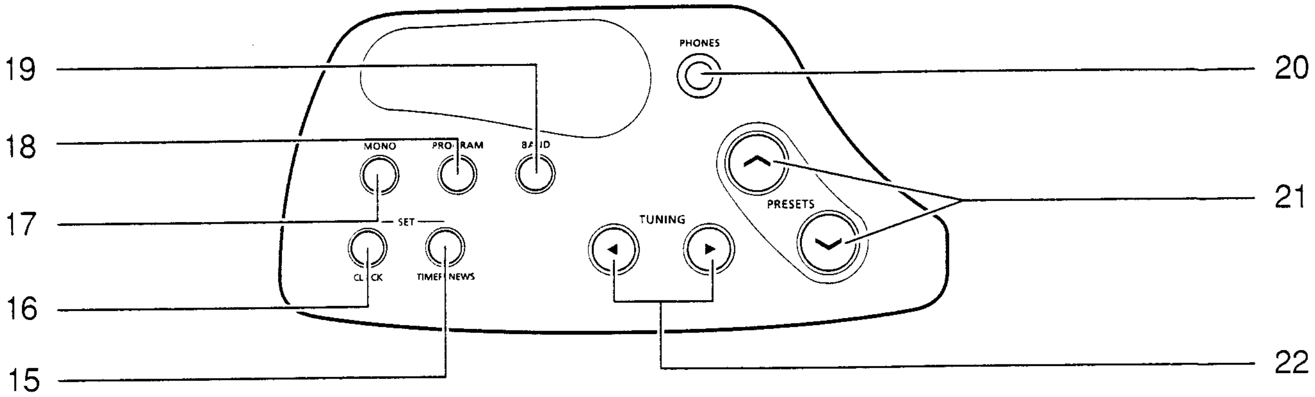
Number of track	:	2 X 2 Stereo
Tape speed	:	4.76 cm/sec ± 2%
Wow and flutter	:	0.38%RMS
Fast-wind time C60	:	130 sec
Bias system	:	90kHz ± 5kHz
Recording playback frequency response within -8dB	:	250Hz - 6300Hz
Signal to noise ratio	:	> 42dB

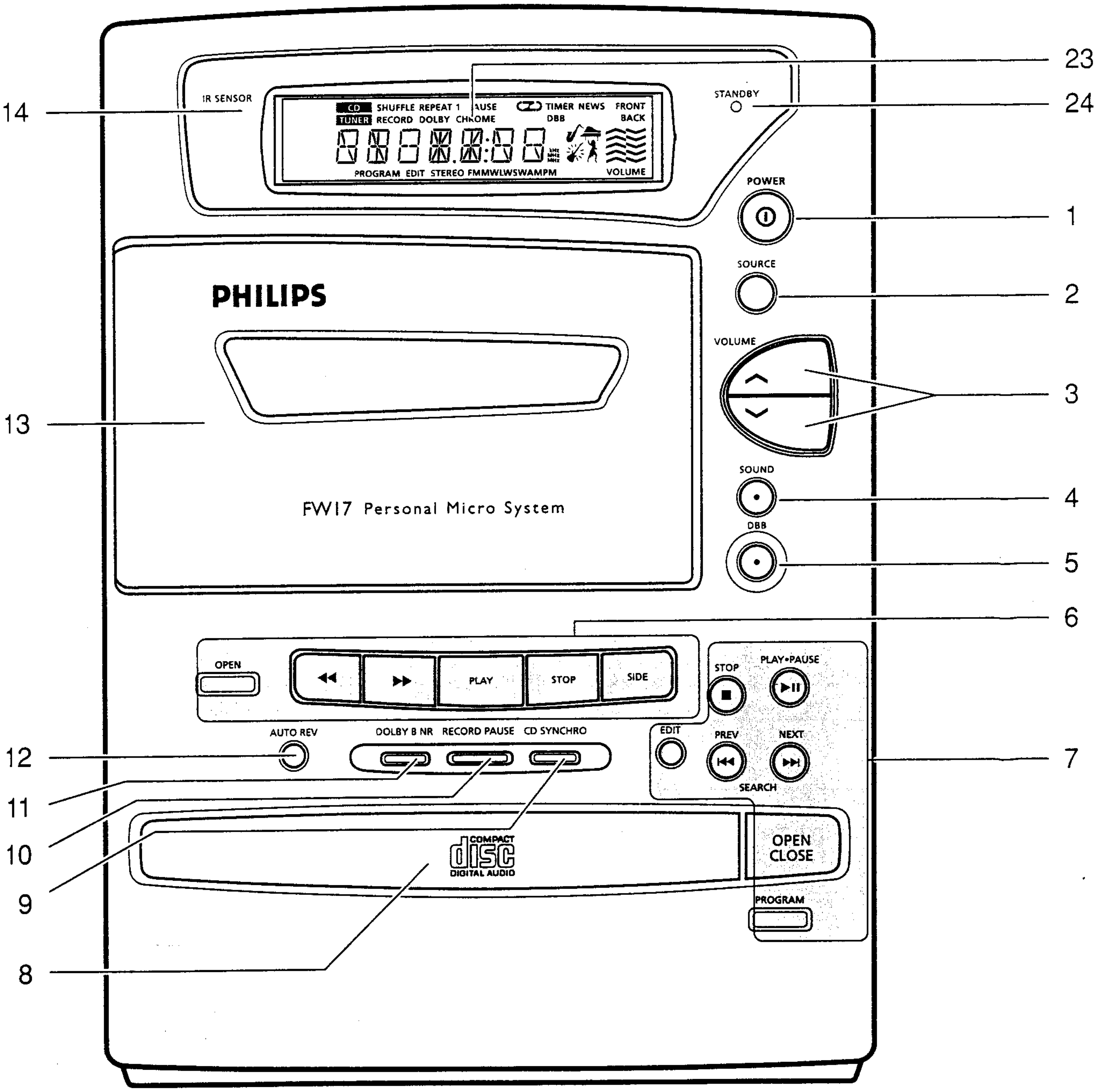
COMPACT DISC

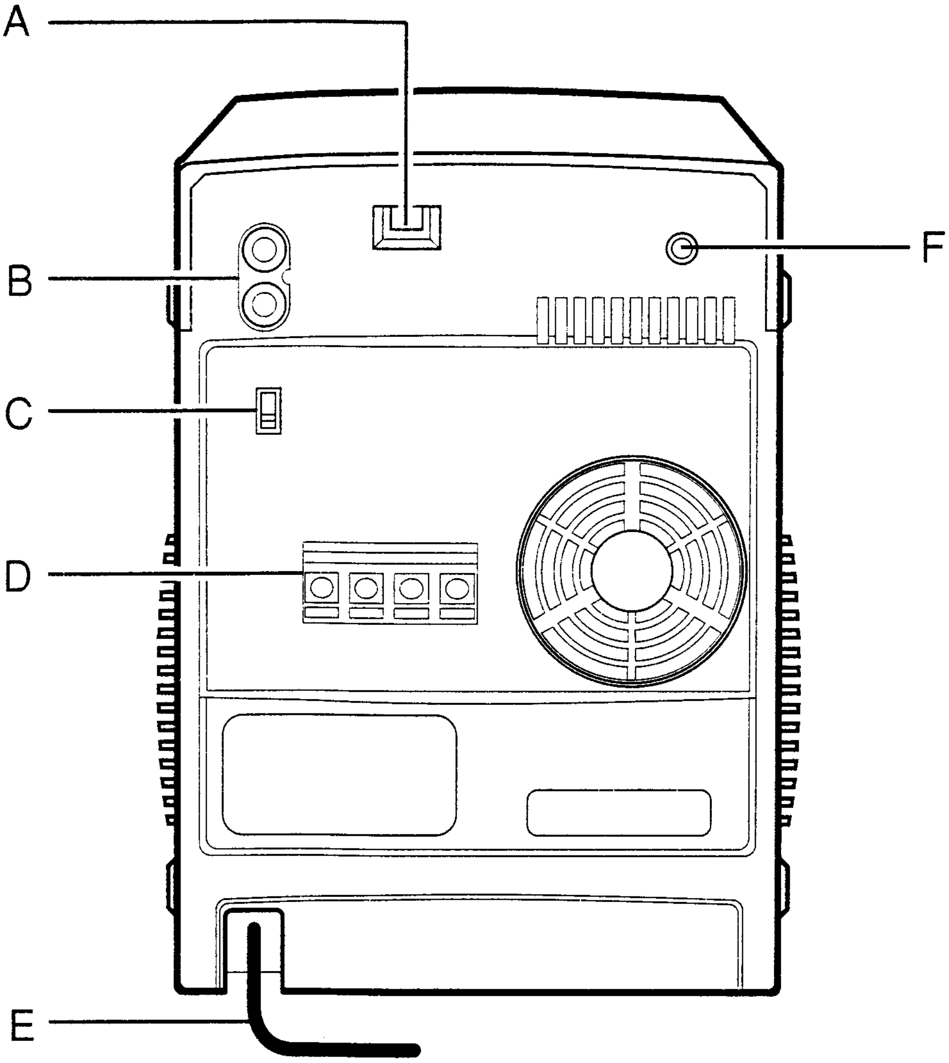
Frequency response within ±3dB	:	20Hz - 20kHz
Signal/Noise ratio	:	≥ 90dB
Distortion at 1kHz	:	≤ 1%
Channel difference at 1kHz	:	≤ 2dB
Channel crosstalk	:	50dB max.
De-emphasis	:	0 or 15/50 µS (Switched automatically by subcode on the disc)

{..} Values for /22 only

CONNECTION AND CONTROL


19
18
17
16
15
PHONES
MONO
PROGRAM
BAND
SET
CLOCK
TIMER NEWS
TUNING
PRESETS
20
21
22


14
IR SENSOR
CD
TUNER
SHUFFLE REPEAT 1 PAUSE
RECORD DOLBY CHROME
TIMER NEWS
DBB
FRONT
BACK
PROGRAM EDIT STEREO FMMWLWSWAMPM
VOLUME
23
STANDBY
24
POWER
1
SOURCE
2
VOLUME
3
PHILIPS
13
FW17 Personal Micro System
SOUND
4
DBB
5
6
OPEN
PLAY
STOP
SIDE
STOP
PLAY•PAUSE
12
AUTO REV
DOLBY B NR
RECORD PAUSE
CD SYNCHRO
EDIT
PREV
NEXT
SEARCH
7
11
10
9
8
COMPACT disc DIGITAL AUDIO
OPEN CLOSE
PROGRAM



CONNECTIONS AND CONTROLS

1	Power		1475
2	Source select		1472
3	Volume up/down		1470, 1471
4	Digital Sound Control		1474
5	Dynamic bass boost		1473
6	Rec/Pb Deck controls	Open	
		Wind <<	1487
		Wind >>	1486
		Play	1485
		Stop	1489
		Side	1490
7	CD Controls	Stop	1491
		Play/Pause	1492
		Edit	1484
		Previous	1477
		Next	1478
		Open/Close	1479
		Program/Review	1480
8	CD tray		
9	CD Syncro		1481
10	Record pause		1482

11	Dolby B NR	1483
12	Auto REV	1488
13	Cassette compartment	
14	IR sensor	6411
15	Set Timer/News	1467
16	Set Clock	1468
17	Mono	1463
18	Program	1462
19	Band	1461
20	Headphone socket	1560
21	Preset Up/Down	1460, 1464
22	Tuning Up/Down	1465, 1466
23	LED Display	1400
24	Standby LED	6401
A	AM antenna socket	1104
B	Aux/TV/DCC Input	1552
C	Voltage selector	1211
D	Loudspeaker sockets	1305
E	Mains cord	
F	FM antenna socket	1101 or 1110

SERVICE TEST PROGRAM 1

Operating sequence	Display shows	Remarks	In case of problems check
Hold "Program" and "Preset Up" button down while Power on to enter Service test program.	XX YY-S # This is the main menu.	where: XX - Type no. numeric YY - Master µP version S - Service mode	
Press "Program"	PASS Main menu reappears after 2 seconds.	Eeprom test	Check IC if Display shows ERR
Press "Band"	NEW Main menu reappears after 2 seconds.	Eeprom is now reset to default data.	
Press "Set Clock"	32K	The Alarm buzzer is turned on. An output signal of 4096Hz is available at pin 37 of the main µProcessor.	Check X'tal
Press "Set Clock"	8M	The output signal at pin 37 is now 3906.25Hz.	Check 8MHz oscillator
Press "Set Clock"	Main menu reappear.		
Press "Set Timer/News"	FAST NOM Main menu reappears after 2 seconds.	Pressing "Set Timer/News" key will alternate between Fast and Normal speed. In the Fast mode the clock increases at 1 minute per second. Leaving the test program now will allow quick customer checks on the clock/timer/alarm function.	Ensure the clock is in normal speed before returning to customer.
Press "Mono" and followed by any key on the set or Remote control. Press "Mono" to return to Main menu	See key test Table 1 and 2.		
Press "Tuning Up"	See Table 3 and Main menu.	Pressing the "Tuning Up" key will scroll through the 4 different displays and the Main menu.	
Press "Tuning down"	AUX TAPE CD TUNER Main menu reappears after 2 seconds.	During source switching the set is not muted.	
Disrupt the mains supply to exit the Service test program.			Ending the Servicetest by pressing the "Power" key from the Main menu will render : * CD error codes to be displayed. * Tuner "Program" and "Autoprogram" keys are deactivated.

Note: XX - Model model (eg 17 for FW17, etc.)
YY - Software verstion, counting down from 99

TABLE 1. SERVICE KEY TEST TABLE

Timer/News/Tuner	Display	Function keys	Display	Tape Keys	Display	CD Keys	Display
Mono	01	Power	13	Dolby B NR	22	Next	19
Program	02	Source	09	REC Pause	23	Prev	20
Band	03	Volume Up	11	CD Syncro	24	Edit	21
Set Clock	12	Volume Down	10	REV Mode	25	Program	17
Set Timer/News	05	Sound	14	< <	26	Stop	30
Preset Up	04	DBB	15	> >	27	Play/Pause	29
Preset Down	08			Play	28	Open/Close	18
Tuning Up	07			Stop	32		
Tuning Down	06			Side	31		

TABLE 2. SERVICE REMOTE CONTROL KEY TEST TABLE

Function/Tuner keys	Display	Tape keys	Display	CD keys	Display
Standby	47 RC	Tape	35 RC	CD	33 RC
Sleep	16 RC	Play	28 RC	Repeat	38 RC
Timer	36 RC	Stop	32 RC	Previous	39 RC
News	37 RC	Pause	31 RC	Shuffle	40 RC
Sound	14 RC	> >	26 RC	Next	41 RC
Volume up (+)	11 RC	< <	27 RC	Pause	43 RC
DBB	15 RC			Stop	45 RC
Volume down (-)	10 RC			Play	46 RC
Tuner	34 RC			Search < <	42 RC
Preset down	08 RC			PSearch > >	44 RC
Preset up	04 RC				

Note: "RC" disappears when the key is released.

TABLE 3. DISPLAY SEQUENCE

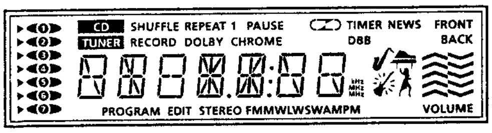
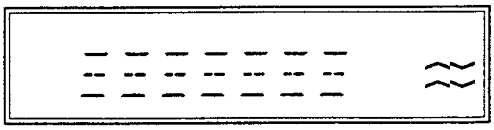
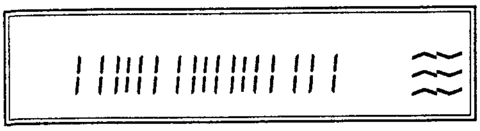
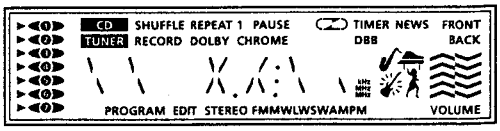
Step	LCD display	Step	LCD display
1	 CD SHUFFLE REPEAT 1 PAUSE TIMER NEWS FRONT TUNER RECORD DOLBY CHROME DBB BACK PROGRAM EDIT STEREO FMMWLWSWAMPM VOLUME	3	
2		4	 CD SHUFFLE REPEAT 1 PAUSE TIMER NEWS FRONT TUNER RECORD DOLBY CHROME DBB BACK PROGRAM EDIT STEREO FMMWLWSWAMPM VOLUME

TABLE 4. CD ERROR CODES TABLE

CD Error number	CD Error
E 1002	Focus error
E 1007	Subcode error, no valid subcode
E 1008	TOC error, out of lead-in while reading TOC
E 1009	CD6 + decoder error
E 1010	Radial error
E 1012	Fatal Sledge error
E 1013	Turntable motor error
E 1030	Too many grooves to jump
E 1031	Search error
E 1032	Search binary error
E 1033	Search index error
E 1034	Search time error
E 1037	Selector error
E 1050	Edit calculation error
E 1051	Edit track count error
E 1052	Edit Optimal error

TABLE 5. TUNER SERVICE TEST FREQUENCIES

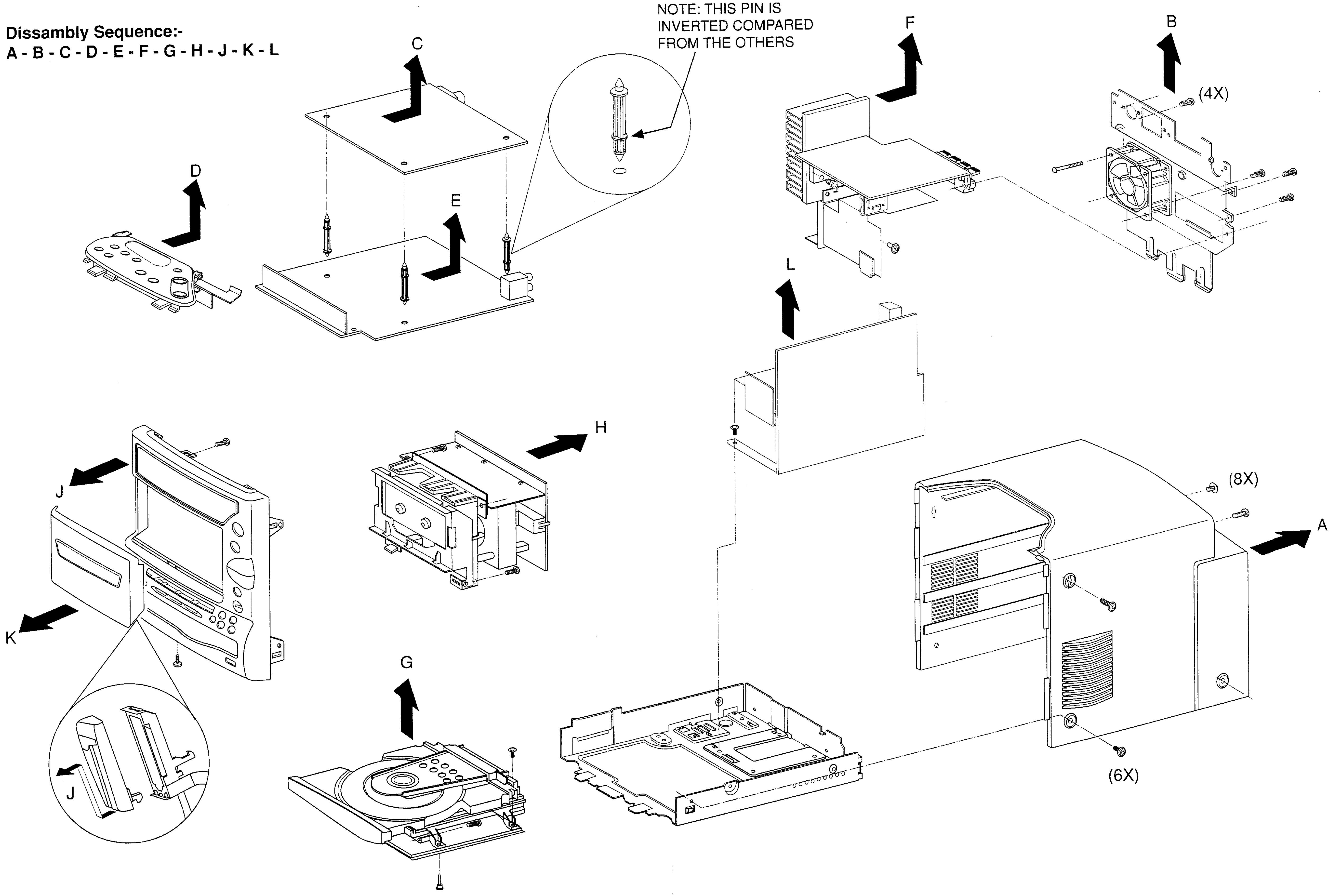
PRESET	Europe “EUR”	East Eur. “EAS”	USA “USA”	Oversea “OSE”	Japan “JAP”	Oversea "OSS"	Eueope "EUS"
1	108.00 MHz	108.00 MHz	108.00 MHz	108.00 MHz	90.00 MHz	108 MHz	108 MHz
2	87.50 MHz	65.81 MHz	87.50 MHz	87.50 MHz	76.00 MHz	87.5 MHz	87.5 MHz
3	1611 kHz	1611 kHz	1710 kHz	1710 kHz	1629 kHz	1710 kHz	1611 kHz
4	522 kHz	522 kHz	530 kHz	530 kHz	522 kHz	530 kHz	522 kHz
5	279 kHz	279 kHz	98 MHz	98 MHz	80 MHz	12.1 MHz	279 kHz
6	153 kHz	153 kHz	560 kHz	560 kHz	558 kHz	3900 kHz	153 kHz
7	98.00 MHz	98.00 MHz	98.00 MHz	98.00 MHz	80.00 MHz	98.00 MHz	98.00 MHz
8	558 kHz	558 kHz	560 kHz	560 kHz	558 kHz	560 kHz	558 kHz
9	1494kHz	1494kHz	1500kHz	1500kHz	1494kHz	1500 kHz	1494 kHz
10	549kHz	549kHz	550kHz	550kHz	549kHz	550 kHz	549 kHz
11						4250 kHz	18.1 MHz
12						8000 kHz	5900 kHz
13						11.9 MHz	6200 kHz
14							17 MHz
15							12 MHz

SERVICE TEST PROGRAM 2

Operating sequence	Display shows	Remarks	In case of problems check
To perform CD test press "CD Play/Pause" at the Main menu screen. Service level 1 is now achieved. Press "Stop" Press "Prev" will exit CD test and return to Main menu.	CDC AA SLED	The CD servo version is display. AA = version number The sledge will move outward then inward.	Pressing "Power" key at the Main menu screen will to exit Service test and enter into Service Play mode. The set will perform as normal except in the CD mode error codes will be displayed. A list of error codes are found in Table 4.
Press "Next" - Service level 2 Press "Prev"	FOC	Laser is turned on and focus is achieved. Return to Service level 1.	
Press "Next" for 2 times - Service level 3 Press "Prev" for 2 times	DISC	Disc motor start to turn. Return to Service level 1.	
Press "Next" for 3 times Press "Prev" for 3 times	RDL	The Radial servo turns on and music can be heard at the Loudspeakers. Return to Service level 1.	
To perform Tuner test press "Preset Up" at the Main menu screen. Use the "Preset Up" and "Preset down" to display the loaded frequencies.	ZZZ See Table 5.	Tuner version is display. ZZZ = Tuner version Service frequencies are now loaded into the EEROM of the µProcessor.	
To end the Service test program disrupt the mains supply.			Ending the Service test by pressing the "Power" key from the Main menu will render: * CD error codes to be displayed. * Tuner "Program" and "Autoprogram" keys are deactivated.

DISASSEMBLY DRAWING

Dissambly Sequence:-
A - B - C - D - E - F - G - H - J - K - L


NOTE: THIS PIN IS
INVERTED COMPARED
FROM THE OTHERS
C
F
B
(4X)
D
E
L
H
J
(8X)
A
K
G
J
(6X)

DISMANTLING OF CD UNIT

Dismantling the tray

a) Press open/close button to open the tray. If the tray doesn´t work, use a small screw driver as shown in Fig.1 point 1 to move the tray outside. After the first centimeter it is possible to pull the tray out by hand.

b) Release two snaps and remove tray.

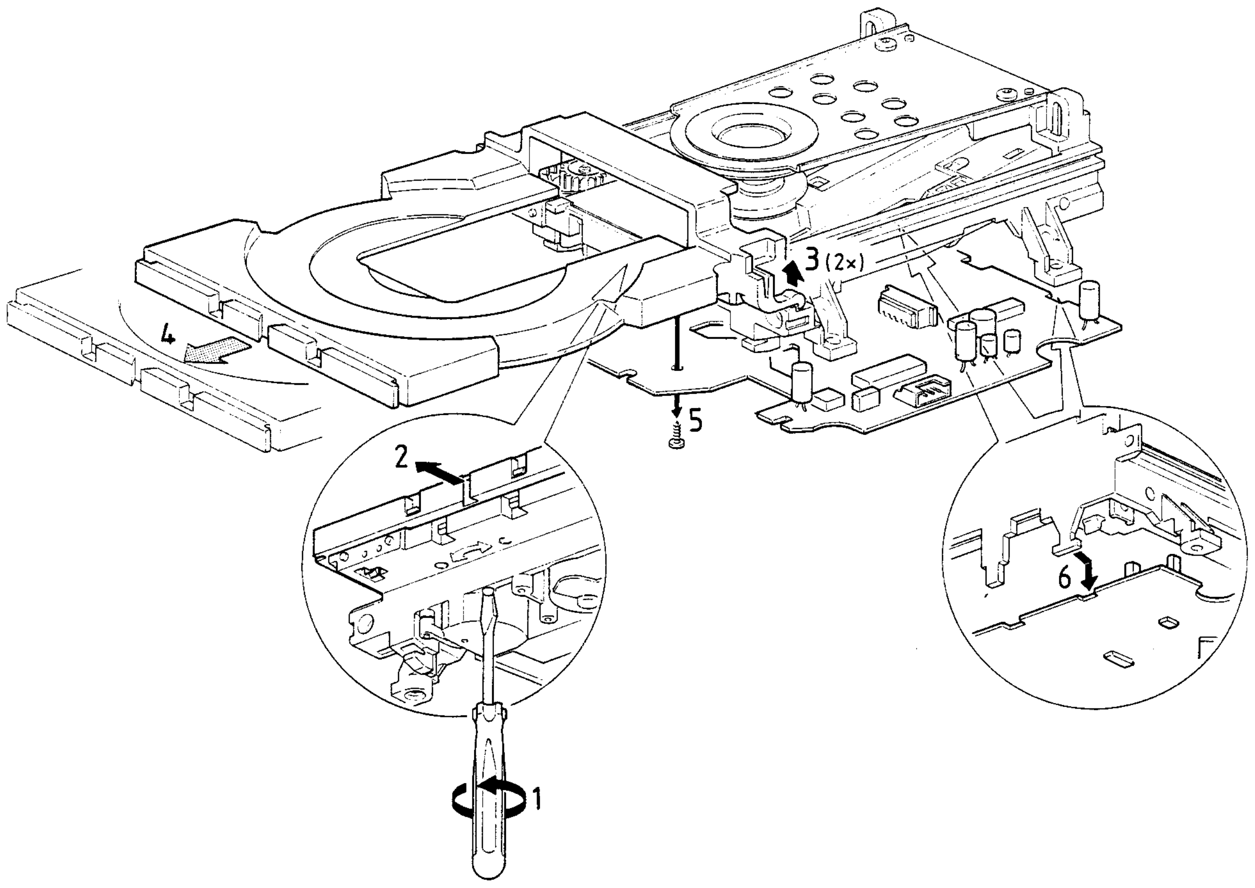


Fig. 1

Assembly of gear

a) Use a pin (e.g. a paperclip) to align the cam wheel (a) and the gear wheel (b) together. See Fig. 2.

b) Fix the wheels with the small plastic washers.

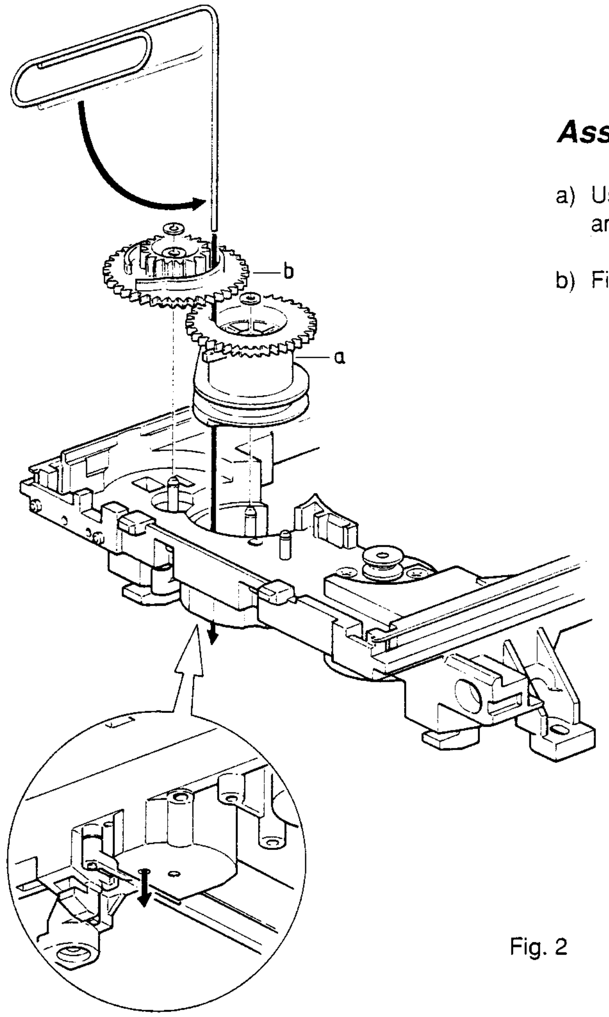


Fig. 2

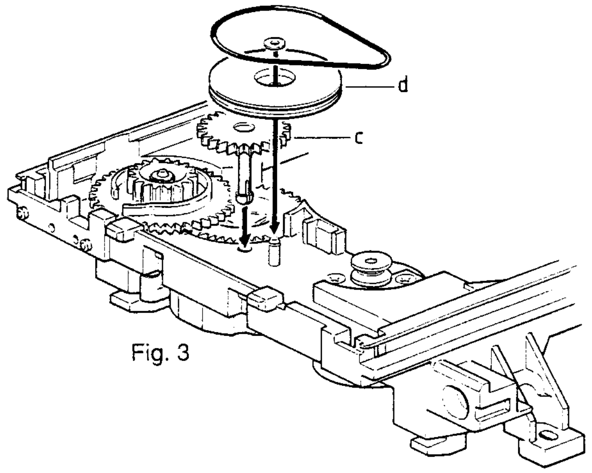


Fig. 3

c) Mount idle wheel2 (c) and idle wheel1 (d) in any position. See Fig. 3.

d) Fix the idle wheel1 with the small plastic washer.

e) Mount the driving belt.

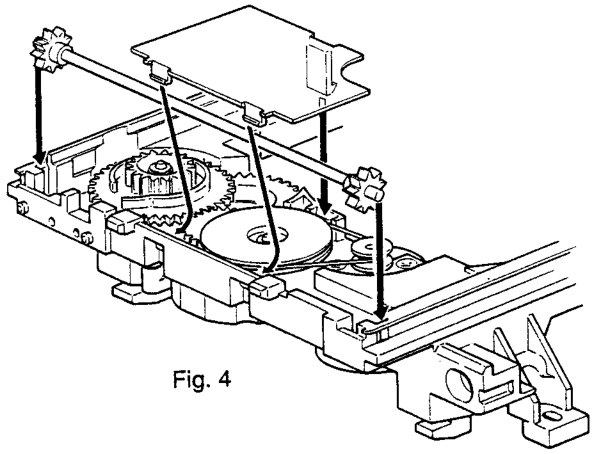


Fig. 4

f) Mount the pinion guiding assy and the cover as shown in Fig. 4.

g) Turn the gear wheel (b) counter clockwise to endposition.

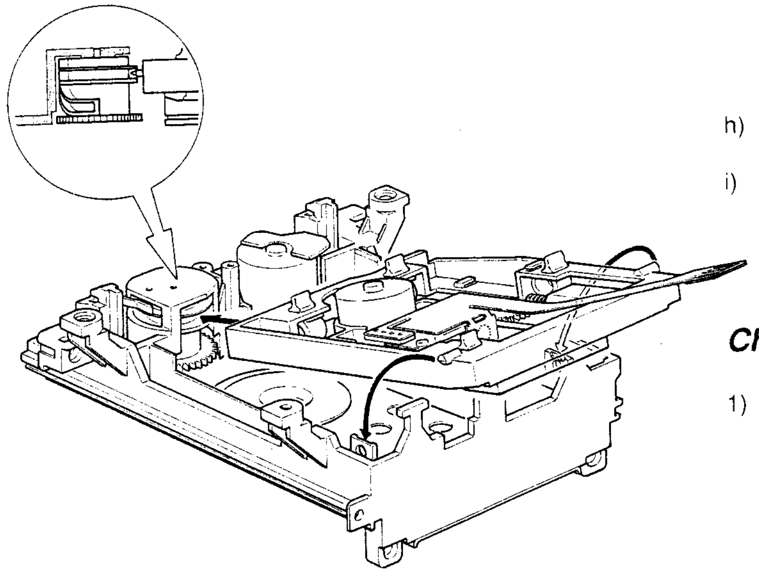


Fig. 5

h) Mount the CD Mechanism as shown in Fig. 5.

i) Mount the tray. (Align the tray to the chassis and push it inside)

Check if tray mechanism works correct!

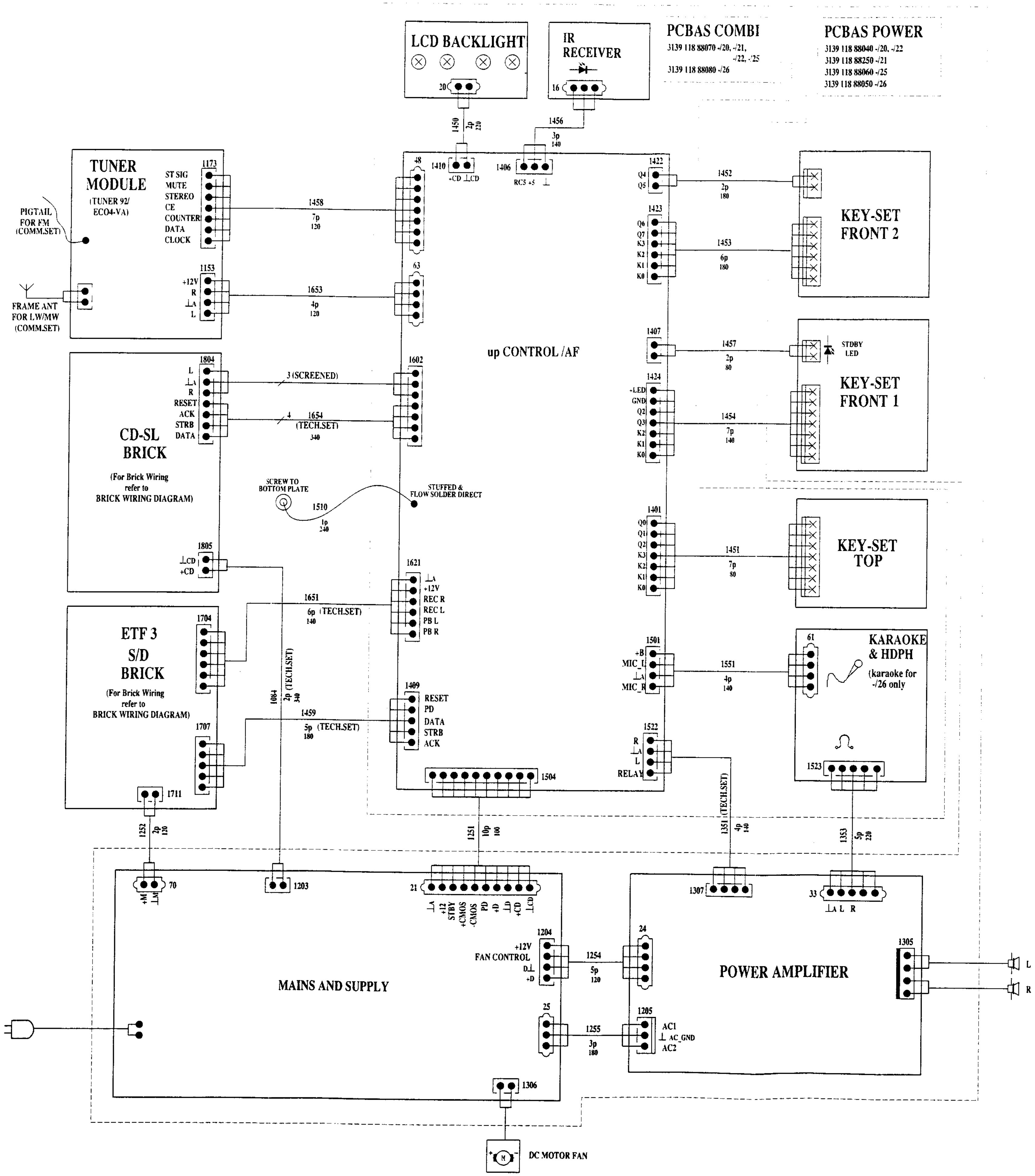
1) Turn the gear wheel (b) clockwise to its endposition. (Use a small screwdriver as shown in Fig. 1 point 1)

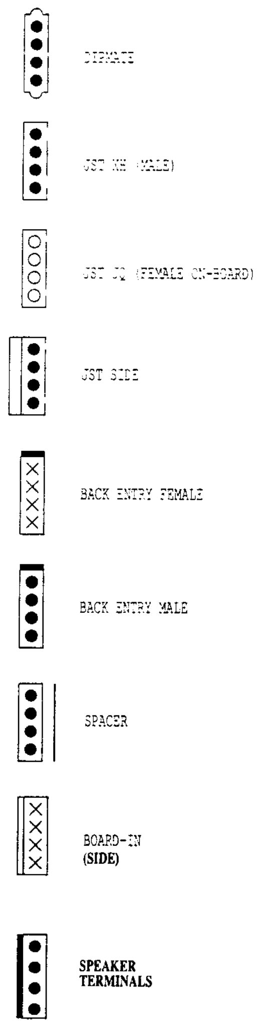
   The tray has to move to inner position first and than the CD Mechanism has to move to its upper position.

2) Turn the gear wheel (b) counter clockwise to its endposition.

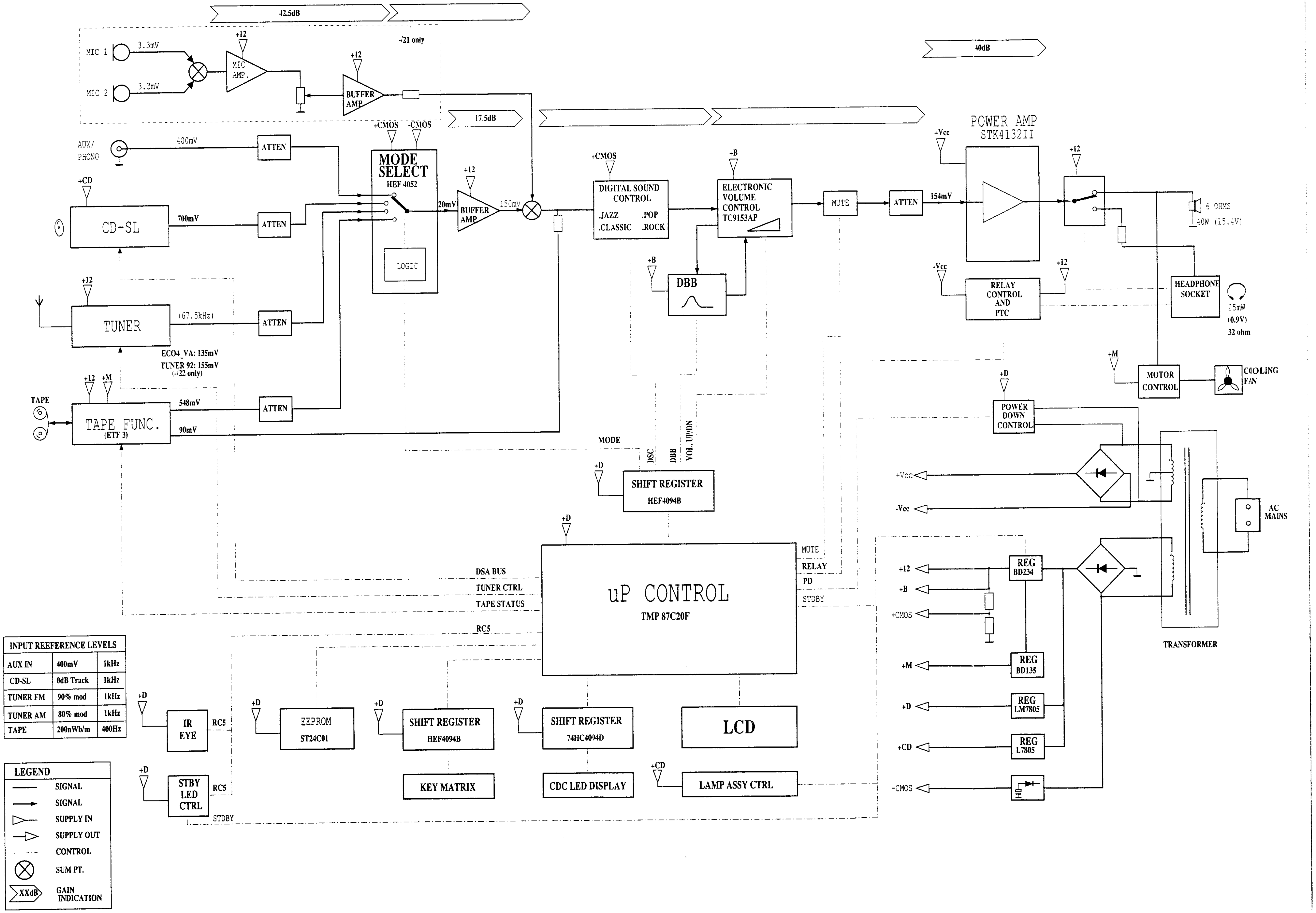
   The CD Mechanism has to move to its lower position first and than the tray has to move to outside.

BLOCK DIAGRAM


LCD BACKLIGHT
20
1450
2p
220
IR
RECEIVER
16
1456
3p
140
PCBAS COMBI
3139 118 88070 -/20, -/21,
-/22, -/25
3139 118 88080 -/26
PCBAS POWER
3139 118 88040 -/20, -/22
3139 118 88250 -/21
3139 118 88060 -/25
3139 118 88050 -/26
TUNER
MODULE
(TUNER 92/
EC04-VA)
PIGTAIL
FOR FM
(COMM.SET)
ST SIG
MUTE
STEREO
CE
COUNTER
DATA
CLOCK
1173
1153
+12V
R
⊥A
L
FRAME ANT
FOR LW/MW
(COMM.SET)
1458
7p
120
1653
4p
120
48
63
1410
+CD ⊥CD
1406
RC5 +5 ⊥
1422
Q4
Q5
1423
Q6
Q7
K3
K2
K1
K0
1452
2p
180
1453
6p
180
KEY-SET
FRONT 2
CD-SL
BRICK
(For Brick Wiring
refer to
BRICK WIRING DIAGRAM)
1804
L
⊥A
R
RESET
ACK
STRB
DATA
3 (SCREENED)
4
1654
(TECH.SET)
340
1602
up CONTROL /AF
1407
1457
2p
80
STDBY
LED
KEY-SET
FRONT 1
1424
+LED
GND
Q2
Q3
K2
K1
K0
1454
7p
140
SCREW TO
BOTTOM PLATE
1510
1p
340
STUFFED &
FLOW SOLDER DIRECT
1805
⊥CD
+CD
1621
⊥A
+12V
REC R
REC L
PB L
PB R
1651
6p (TECH.SET)
140
1401
Q0
Q1
Q2
K3
K2
K1
K0
1451
7p
80
KEY-SET
TOP
ETF 3
S/D
BRICK
(For Brick Wiring
refer to
BRICK WIRING DIAGRAM)
1704
1707
1711
1084
2p (TECH.SET)
340
1409
RESET
PD
DATA
STRB
ACK
1459
5p (TECH.SET)
180
1501
+B
MIC_L
⊥A
MIC_R
1551
4p
140
61
KARAOKE
& HDPH
(karaoke for
-/26 only
1522
R
⊥A
L
RELAY
1504
1523
1252
2p
120
1251
10p
100
1351 (TECH.SET)
4p
140
1353
5p
220
70
+M
⊥M
1203
21
⊥A
+12
STBY
+CMOS
-CMOS
PD
+D
⊥D
+CD
⊥CD
1307
33
⊥A L R
1204
+12V
FAN CONTROL
D⊥
+D
1254
5p
120
24
MAINS AND SUPPLY
POWER AMPLIFIER
1305
L
R
25
1255
3p
180
1205
AC1
⊥ AC_GND
AC2
1306
M
DC MOTOR FAN


DIPMATE
JST XH (MALE)
JST JQ (FEMALE ON-BOARD)
JST SIDE
BACK ENTRY FEMALE
BACK ENTRY MALE
SPACER
BOARD-IN
(SIDE)
SPEAKER
TERMINALS

WIRING DIAGRAM


42.5dB
40dB
17.5dB
-/21 only
MIC 1
MIC 2
3.3mV
3.3mV
+12
MIC AMP.
BUFFER AMP
AUX/ PHONO
400mV
ATTEN
+CMOS
-CMOS
MODE SELECT
HEF 4052
LOGIC
20mV
BUFFER AMP
150mV
+CD
CD-SL
700mV
TUNER
(67.5kHz)
ECO4_VA: 135mV
TUNER 92: 155mV
(-/22 only)
+M
TAPE
TAPE FUNC.
(ETF 3)
548mV
90mV
DIGITAL SOUND CONTROL
.JAZZ
.POP
.CLASSIC
.ROCK
+B
ELECTRONIC VOLUME CONTROL
TC9153AP
DBB
MUTE
154mV
+Vcc
POWER AMP
STK4132II
-Vcc
RELAY CONTROL AND PTC
6 OHMS
40W (15.4V)
HEADPHONE SOCKET
25mW
(0.9V)
32 ohm
MOTOR CONTROL
COOLING FAN
+D
POWER DOWN CONTROL
MODE
DSC
DBB
VOL. UP/DN
SHIFT REGISTER
HEF4094B
uP CONTROL
TMP 87C20F
DSA BUS
TUNER CTRL
TAPE STATUS
RC5
MUTE
RELAY
PD
STDBY
+Vcc
-Vcc
AC MAINS
+12
+B
+CMOS
+M
+D
+CD
-CMOS
REG BD234
REG BD135
REG LM7805
REG L7805
TRANSFORMER
IR EYE
STBY LED CTRL
EEPROM
ST24C01
SHIFT REGISTER
HEF4094B
KEY MATRIX
SHIFT REGISTER
74HC4094D
CDC LED DISPLAY
LCD
LAMP ASSY CTRL
LEGEND
SIGNAL
SIGNAL
SUPPLY IN
SUPPLY OUT
CONTROL
SUM PT.
XXdB
GAIN INDICATION

INPUT REEFERENCE LEVELS		
AUX IN	400mV	1kHz
CD-SL	0dB Track	1kHz
TUNER FM	90% mod	1kHz
TUNER AM	80% mod	1kHz
TAPE	200nWb/m	400Hz

ESD

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

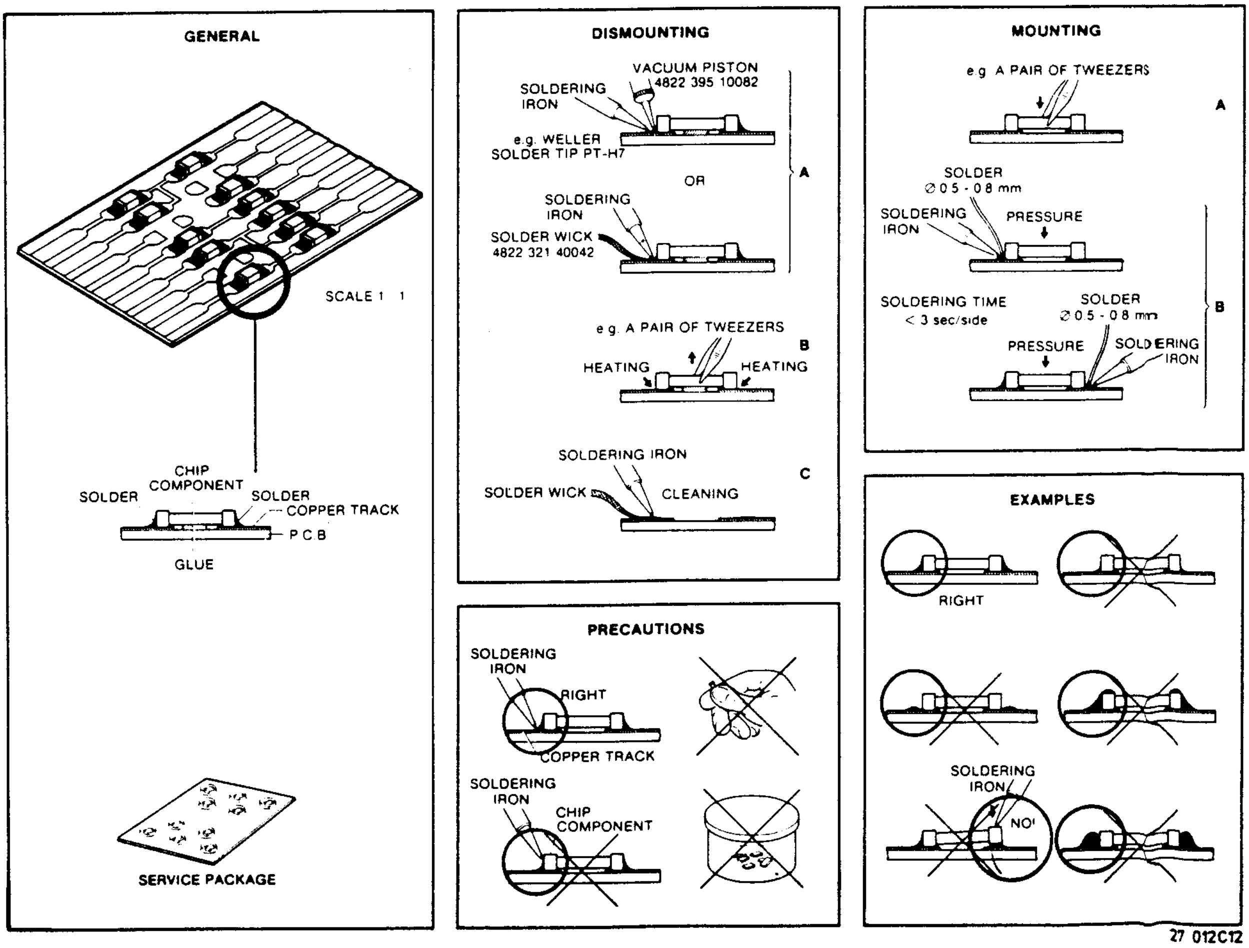
(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

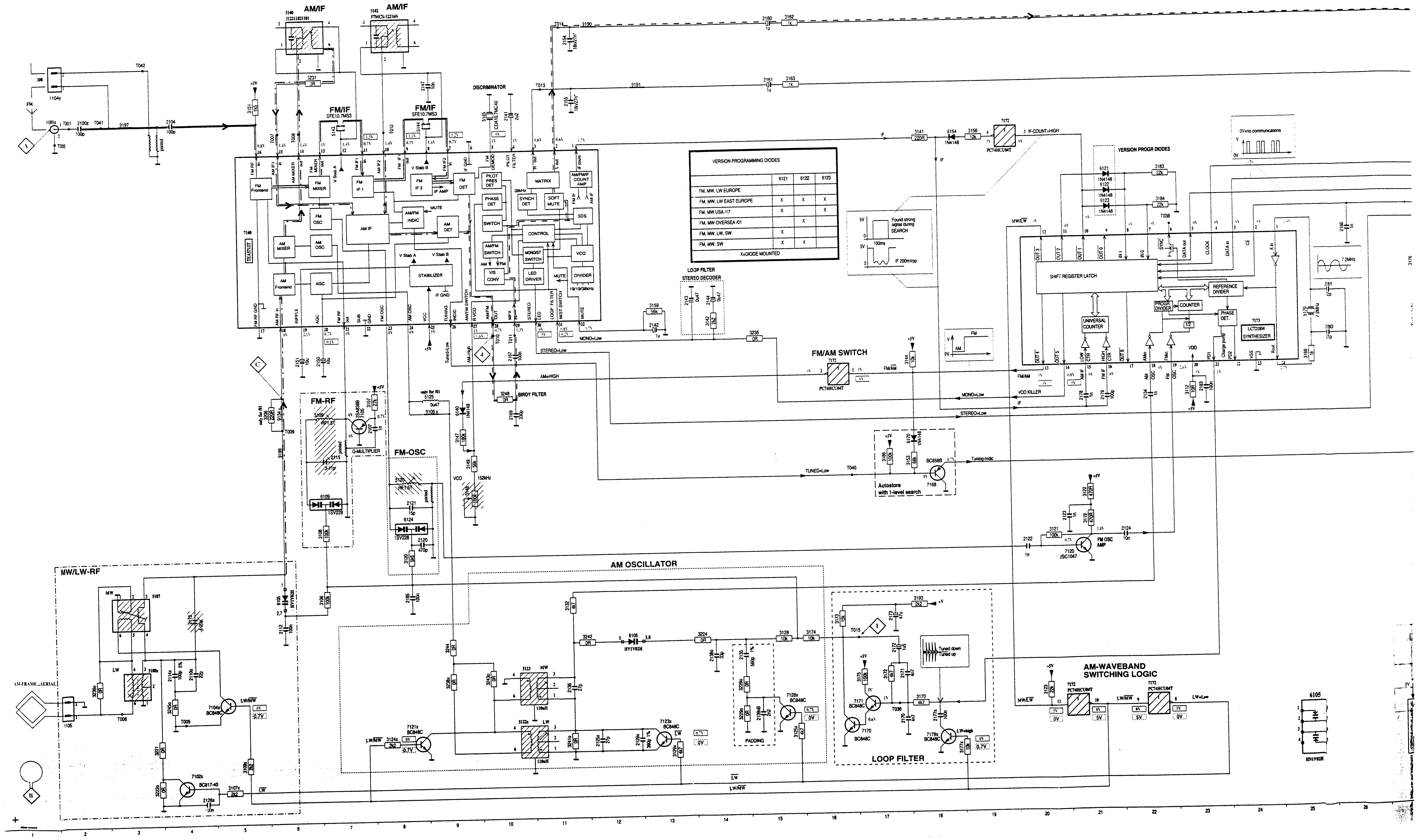
(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

HANDLING CHIP COMPONENTS

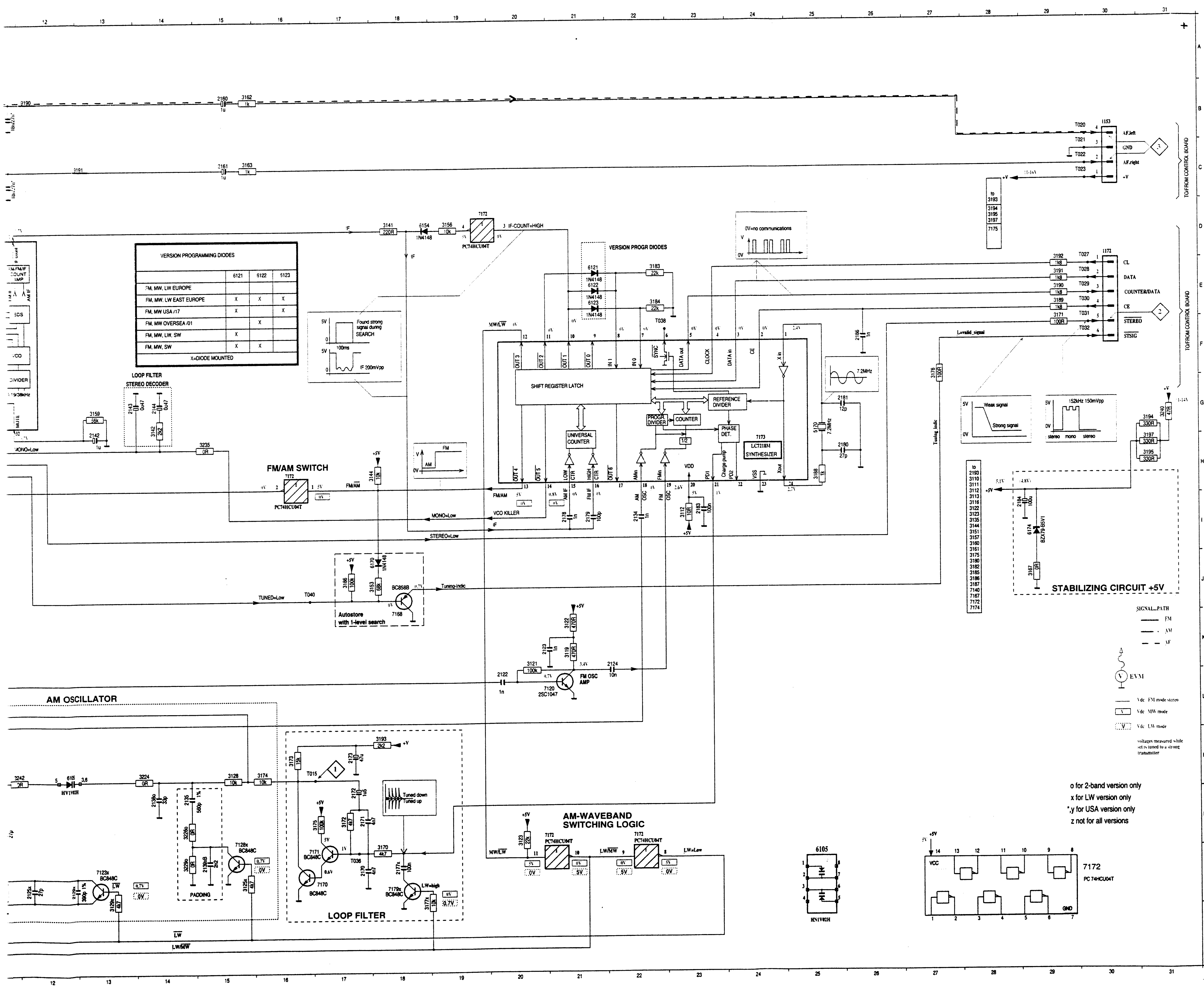

GENERAL
SCALE 1 : 1
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P C B
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON 4822 395 10082
SOLDERING IRON
e.g. WELLER SOLDER TIP PT-H7
OR
SOLDERING IRON
SOLDER WICK 4822 321 40042
A
e.g. A PAIR OF TWEEZERS
HEATING
HEATING
B
SOLDERING IRON
SOLDER WICK
CLEANING
C
MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER ∅ 0.5 - 0.8 mm
SOLDERING IRON
PRESSURE
SOLDERING TIME < 3 sec/side
SOLDER ∅ 0.5 - 0.8 mm
PRESSURE
SOLDERING IRON
B
PRECAUTIONS
SOLDERING IRON
RIGHT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
EXAMPLES
RIGHT
SOLDERING IRON
NO!
27 012C12

TUNER UNIT ECO4-VA (MINI)


AM/IF
AM/IF
FM/IF
FM/IF
DISCRIMINATOR
FM-RF
FM-OSC
MW/LW-RF
AM OSCILLATOR
LOOP FILTER
STEREO DECODER
FM/AM SWITCH
AM-WAVEBAND
SWITCHING LOGIC
LOOP FILTER
PADDING
BIRDY FILTER
Q-MULTIPLIER
VERSION PROGR DIODES
TEA5712T
LC7218M
SYNTHESIZER
SHIFT REGISTER LATCH
UNIVERSAL COUNTER
PROGR DIVIDER
COUNTER
REFERENCE DIVIDER
PHASE DET.
FM Frontend
FM MIXER
FM OSC
AM MIXER
AM OSC
AM Frontend
AGC
AM IF
FM IF 1
FM IF 2
FM DET
AM/FM INDIC
AM DET
STABILIZER
PILOT PRES DET
PHASE DET
SWITCH
AM/FM SWITCH
V/S CONV
MATRIX
SYNCH DET
SOFT MUTE
CONTROL
MONOST SWITCH
LED DRIVER
SDS
VCO
DIVIDER
MUTE
AM/FM/IF COUNT AMP
Found strong signal during SEARCH
100ms
IF 200mVpp
0V=no communications
7.2MHz
Tuned down
Tuned up
Autostore with 1-level search
AM-FRAME AERIAL
FM
IF-COUNT=HIGH
STEREO=Low
MONO=Low
TUNED=Low
AM=HIGH
VCO KILLER
Tuning-Indic
LW=Low
LW/MW
LW=high
FM OSC AMP
PC74HCU04T
BC848C
BC858B
BC817-40
2SC1047
2SA838
1SV228
HV1V02H
1N4148
SFE10.7MS3
CDA10.7MC40
6105
HN1V02H

VERSION PROGRAMMING DIODES	6121	6122	6123
FM, MW, LW EUROPE			
FM, MW, LW EAST EUROPE	X	X	X
FM, MW USA /17	X		X
FM, MW OVERSEA /01		X	
FM, MW, LW, SW	X		
FM, MW, SW	X	X	

X=DIODE MOUNTED


AM OSCILLATOR
FM/AM SWITCH
LOOP FILTER
STEREO DECODER
AM-WAVEBAND
SWITCHING LOGIC
LOOP FILTER
PADDING
STABILIZING CIRCUIT +5V
VERSION PROGR DIODES
Autostore
with 1-level search
SHIFT REGISTER LATCH
UNIVERSAL COUNTER
PROGR DIVIDER
COUNTER
REFERENCE DIVIDER
PHASE DET.
7173
LC7218M
SYNTHESIZER
FM OSC AMP
7120
2SC1047
BC858B
7168
PC74HCU04T
7172
TO/FROM CONTROL BOARD
TO/FROM CONTROL BOARD
AF.left
GND
AF.right
+V
CL
DATA
COUNTER/DATA
CE
STEREO
STSIG
1153
1172
IF-COUNT=HIGH
MONO=Low
STEREO=Low
TUNED=Low
VCO KILLER
FM/AM
MW/LW
LW/MW
LW=Low
LW=high
Tuning-indic
L=valid_signal
0V=no communications
Found strong signal during SEARCH
100ms
IF 200mVpp
7.2MHz
Weak signal
Strong signal
152kHz 150mVpp
stereo mono stereo
Tuned down
Tuned up
BZX79-B5V1
HV1V02H
6105
7172
PC 74HCU04T
VCC
GND
SIGNAL_PATH
FM
AM
AF
EVM
Vdc FM mode stereo
Vdc MW mode
Vdc LW mode
voltages measured while set is tuned to a strong transmitter

VERSION PROGRAMMING DIODES

	6121	6122	6123
FM, MW, LW EUROPE			
FM, MW, LW EAST EUROPE	X	X	X
FM, MW USA /17	X		X
FM, MW OVERSEA /01		X	
FM, MW, LW, SW	X		
FM, MW, SW	X	X	
X=DIODE MOUNTED			

o for 2-band version only
x for LW version only
*,y for USA version only
z not for all versions

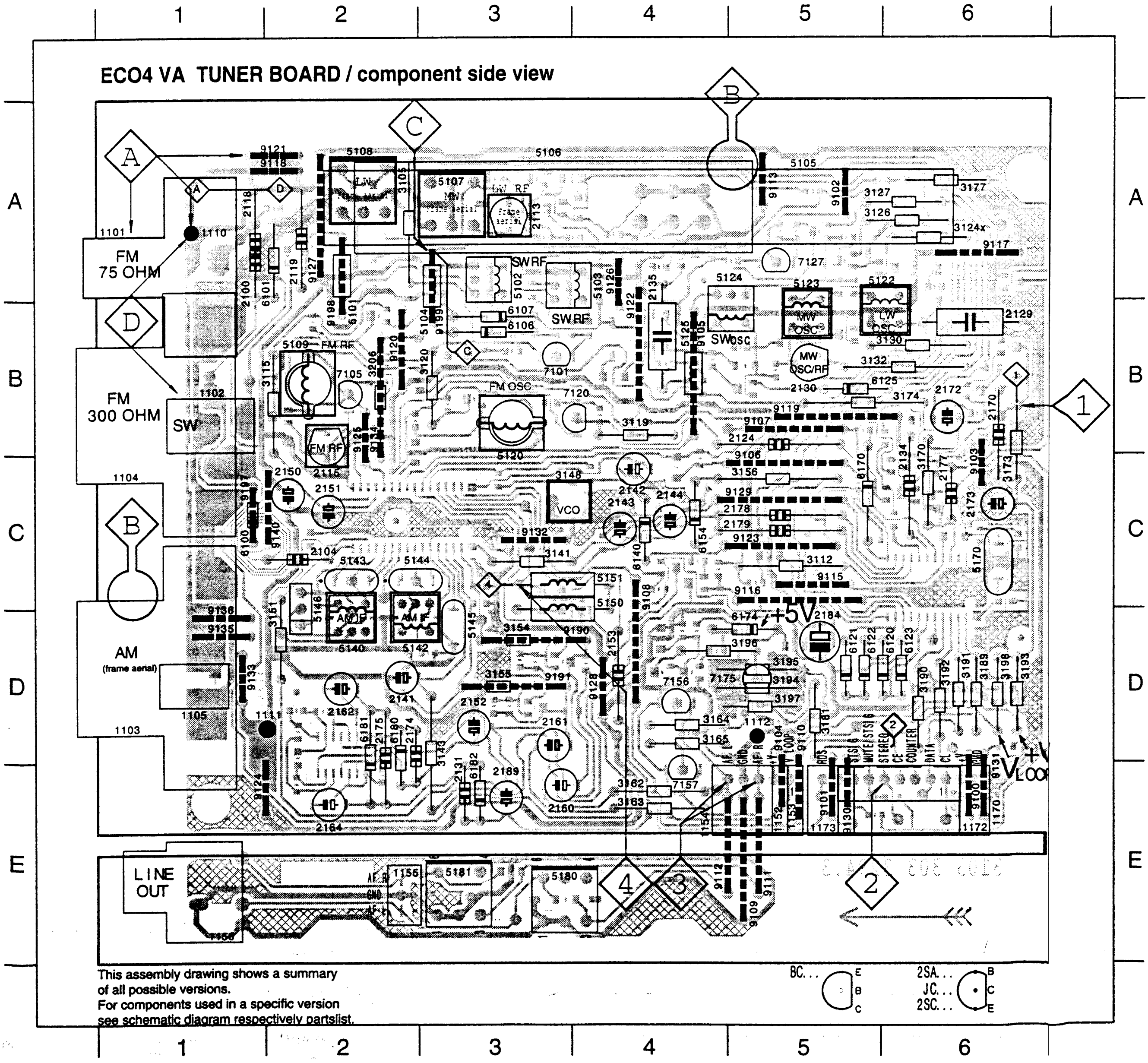
1101z	C 1
1104y	C 2
1105	O 2
1153	B30
1172	D30
2100z	C 2
2104	C 4
2107	I 8
2110o	N 4
2112	N 6
2113	M 4
2114x	N 4
2115	J 7
2120	K 8
2121	K 8
2122	K20
2123	K20
2124	K22
2125x	O12
2126x	P 4
2129x	O12
2134	I22
2135	N14
2136	N11
2138o	N14
2139x	O15
2141	C10
2142	G13
2143	G13
2144	G14
2147	C 9
2150	H 7
2151	H 6
2154	C11
2155	C12
2160	B15
2161	C15
2167	H10
2169	I10
2170	O17
2171	N17
2172	M17
2173	M17
2177x	O18
2178	I21
2179	I21
2180	H25
2181	G25
2183	I23
2184	I29
2185	L 8
2186	F26
3106	L 7
3107x	P 5
3108	K 7
3109x	O 5
3112	I23
3119	K21
3120	L 8
3121	K20
3122	K21
3123	N20
3124x	O 8
3125x	O15
3128	M15
3129x	O13
3132	M12
3141	D18
3142	G14
3144	H18
3147	I 9
3148	J 9
3149	J 9
3151	C 4
3153	J18
3156	D19
3157	I 7
3159	G13
3162	B15
3163	C15
3167	J29
3170	N18
3171	F29
3172	N17
3173	M16
3174	M16
3175	N17
3176	F27
3177x	O18
3183	E22
3184	E22
3186	J17
3188	H25
3189	E29
3190	E29
3191	E29
3192	E29
3193	M18
3194	G31
3195	H31
3197	H31
3206	I 6
3221	O 3
3222o	P 3
3224	M14
3226o	N14
3229o	O14
3231	C 7
3235	H15
3236o	N 2
3238x	N 9
3240	G31
3241o	O11
3242	N11
3243o	N10
3244	M 9
3245o	N 4
3248	I10
5107	M 2
5108x	N 3
5109	I 7
5120	J 8
5122x	O10
5123	N10
5125	I 9
5140	A 6
5142	A 8
5143	D 7
5144	D 9
5145	C10
5170	G25
6105	M12
6105	N6
6109	J 7
6121	E21
6122	E21
6123	E21
6124	K 8
6140	I 9
6154	D18
6170	J18
6174	I29
7102x	P 4
7104x	N 5
7105	I 7
7120	L20
7121x	O 8
7123x	O13
7128x	N15
7140	E 5
7168	J18
7170	O17
7171	O17
7172	H16
7172	D20
7172	O20
7172	N22
7172	N20
7172	O22
7173	H24
7179x	O18
9105	I 9
9134	I 6
9190	B12
9191	C13
9197	C 3
9199	J 6

T001	C 2
T002	D 2
T005	O 4
T006	O 3
T007	D 6
T008	D 6
T009	I 6
T010	H10
T011	H10
T012	C 8
T013	C11
T014	B11
T015	M16
T020	B29
T021	C29
T022	C29
T023	C29
T027	D30
T028	E30
T029	E30
T030	E30
T031	E30
T032	F30
T033	F30
T036	O17
T038	F22
T040	J13
T041	C 2
T042	B 3

1101	A 1	1173	E 5	2142	C 4	2175	D 2	3127	A 6	3173	B 6	5101	A 2	5142	D 2	6121	D 5	7156	D 4	9112	E 4	9128	D 4
1102	B 1	2100	A 1	2143	C 4	2177	C 6	3130	B 6	3174	B 5	5102	A 3	5143	C 2	6122	D 5	7157	E 4	9113	A 5	9129	C 5
1103	D 1	2104	C 2	2144	C 4	2178	C 5	3132	B 6	3177	A 6	5103	A 3	5144	C 2	6123	D 6	7175	D 5	9115	C 5	9130	E 5
1104	B 1	2106	B 4	2150	C 2	2179	C 5	3141	C 3	3181	D 5	5104	A 3	5145	D 3	6125	B 5	9100	E 6	9116	C 5	9131	E 6
1105	D 1	2113	A 3	2151	C 2	2184	D 5	3143	D 3	3189	D 6	5105	A 4	5146	D 2	6140	C 4	9101	E 5	9117	A 6	9132	C 3
1110	A 1	2115	B 2	2152	D 3	2189	E 3	3148	C 3	3190	D 6	5106	A 4	5150	D 3	6154	C 4	9102	A 5	9118	A 2	9133	D 1
1111	D 2	2118	A 1	2153	D 4	2190	A 2	3151	D 2	3191	D 6	5107	A 3	5151	C 3	6170	C 5	9103	C 6	9119	B 5	9134	B 2
1112	D 5	2119	A 2	2160	E 3	2191	A 6	3154	D 3	3192	D 6	5108	A 2	5170	C 6	6174	D 5	9104	E 5	9120	B 2	9135	D 1
1152	E 5	2124	B 5	2161	D 3	3105	A 2	3155	D 3	3193	D 6	5109	B 2	5180	E 3	6180	D 2	9105	B 4	9121	A 2	9136	D 1
1153	E 5	2129	B 6	2162	D 2	3112	C 5	3156	C 5	3194	D 5	5120	B 3	5181	E 3	6181	D 2	9106	C 5	9122	B 4	9140	C 2
1154	E 4	2130	B 5	2164	E 2	3115	B 2	3162	E 4	3195	D 5	5122	B 6	6100	C 1	6182	E 3	9107	B 5	9123	C 5	9190	D 3
1155	E 2	2131	E 3	2170	B 6	3119	B 4	3163	E 4	3196	D 4	5123	B 5	6101	A 2	7101	B 3	9108	D 4	9124	E 1	9191	D 3
1156	E 1	2134	C 6	2172	B 6	3120	B 3	3164	D 4	3197	D 5	5124	B 5	6106	B 3	7105	B 2	9109	E 5	9125	B 2	9197	C 1
1170	E 6	2135	B 4	2173	C 6	3124	A 6	3165	D 4	3198	D 6	5125	B 4	6107	B 3	7120	B 4	9110	E 5	9126	A 4	9198	A 2
1172	E 6	2141	D 2	2174	D 2	3126	A 6	3170	C 6	3206	B 2	5140	D 2	6120	D 6	7127	A 5	9111	E 5	9127	A 2	9199	A 3

o for AM-version only
x for LW-version only
y for USA version only
z not for all versions

ECO4 VA TUNER BOARD / component side view

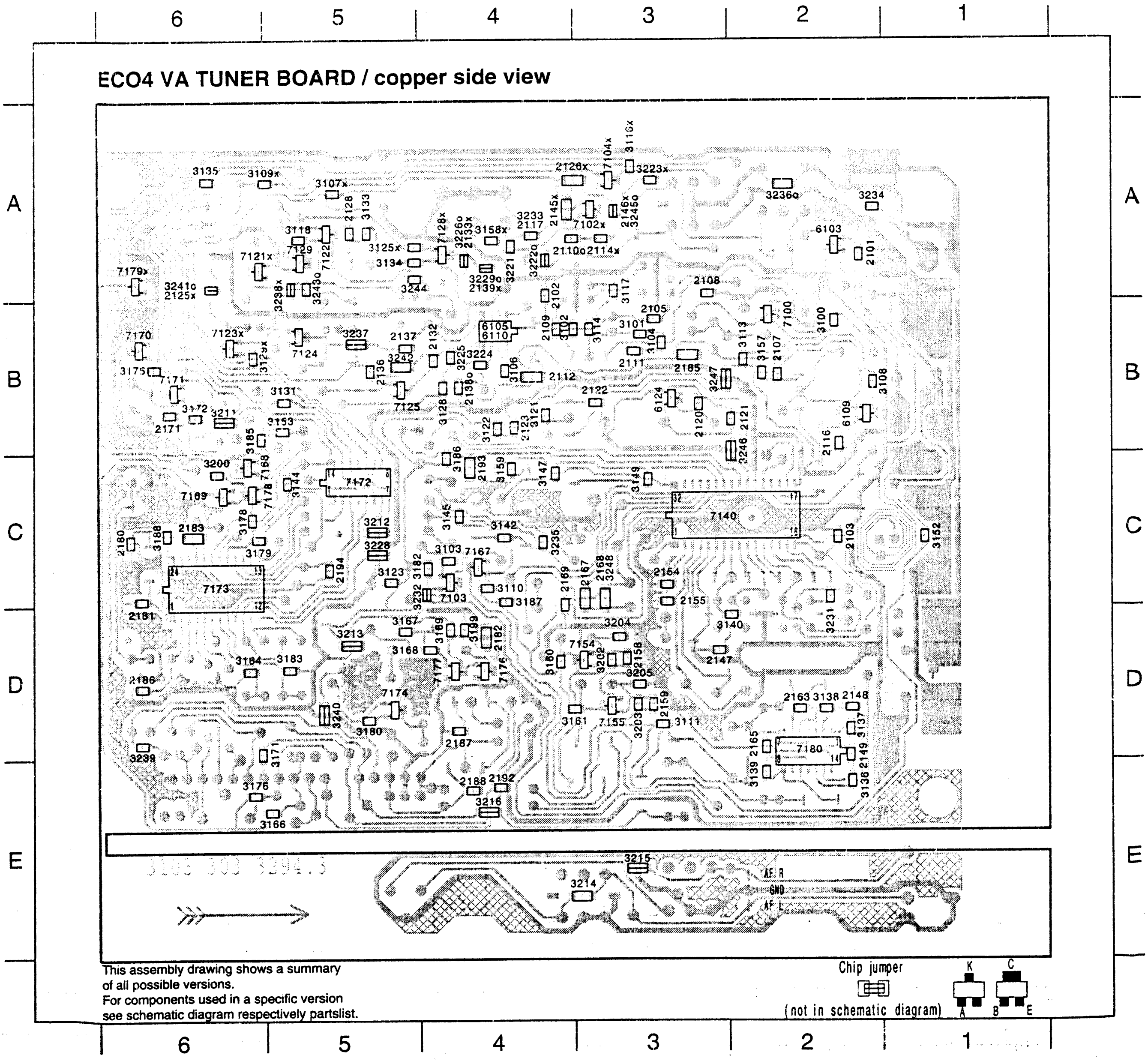

1
2
3
4
5
6
A
B
C
D
E
FM
75 OHM
FM
300 OHM
SW
AM
(frame aerial)
LINE
OUT
AF R
GND
AF L
1101
1102
1103
1104
1105
1110
1111
1112
1156
SW RF
SW RF
SWosc
MW OSC
LW OSC
MW OSC/RF
FM RF
FM RF
FM OSC
VCO
AM IF
AM IF
LW
MW
LW RF
+5V
RDS
MUTE (STS)
STEREO
CE
COUNTER
DATA
CL
+V
VLOOP
BC...
E
B
C
2SA...
JC...
2SC...
B
C
E

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

2101	A 2	2122	B 3	2149	D 2	2185	B 3	3109x	A 5	3133	A 5	3157	B 2	3180	D 5	3212	C 5	3233	A 4	3248	C 3	7128x	A 4	7178	C 6
2102	A 4	2123	B 4	2154	C 3	2186	D 6	3110	C 4	3134	A 5	3158x	A 4	3182	C 4	3213	D 5	3234	A 2	6103	A 2	7129	A 5	7179x	A 6
2103	C 2	2125x	A 6	2155	C 3	2187	D 4	3111	D 3	3135	A 6	3159	C 4	3183	D 5	3214	E 3	3235	C 4	6105	B 4	7140	C 2	7180	D 2
2105	B 3	2126x	A 3	2158	D 3	2188	E 4	3113	B 2	3136	E 2	3160	D 4	3184	D 6	3215	E 3	3236o	A 2	6109	B 2	7154	D 3		
2107	B 2	2128	A 5	2159	D 3	2192	E 4	3114	B 3	3137	D 2	3161	D 3	3185	B 6	3216	E 4	3237	B 5	6110	B 4	7155	D 3		
2108	A 3	2132	B 4	2163	D 2	2193	C 4	3116x	A 3	3138	D 2	3166	E 5	3186	C 4	3221	A 4	3238x	A 5	6124	B 3	7167	C 4		
2109	B 4	2133x	A 4	2165	E 2	2194	C 5	3117	A 3	3139	D 2	3167	D 5	3187	C 4	3222o	A 4	3239	D 6	7100	B 2	7168	C 6		
2110o	A 4	2136	B 5	2167	C 3	3100	B 2	3118	A 5	3140	D 2	3168	D 4	3188	C 6	3223x	A 3	3240	D 5	7102x	A 3	7169	C 6		
2111	B 3	2137	B 5	2168	C 3	3101	B 3	3121	B 4	3142	C 4	3169	D 4	3199	D 4	3224	B 4	3241o	A 6	7103	C 4	7170	B 6		
2112	B 4	2138o	B 4	2169	C 4	3102	B 3	3122	B 4	3144	C 5	3171	D 6	3200	C 6	3225	B 4	3242	B 5	7104x	A 3	7171	B 6		
2114x	A 3	2139x	A 4	2171	B 6	3103	C 4	3123	C 5	3145	C 4	3172	B 6	3202	D 3	3226o	A 4	3243o	A 5	7121x	A 6	7172	C 5		
2116	B 2	2145x	A 4	2180	C 6	3104	B 3	3125x	A 5	3147	C 4	3175	B 6	3203	D 3	3228	C 5	3244	A 5	7122	A 5	7173	C 6		
2117	A 4	2146x	A 3	2181	C 6	3106	B 4	3128	B 4	3149	C 3	3176	E 6	3204	D 3	3229o	A 4	3245o	A 3	7123x	B 6	7174	D 5		
2120	B 3	2147	D 3	2182	D 4	3107x	A 5	3129x	B 6	3152	C 1	3178	C 6	3205	D 3	3231	C 2	3246	B 2	7124	B 5	7176	D 4		
2121	B 2	2148	D 2	2183	C 6	3108	B 2	3131	B 5	3153	B 5	3179	C 6	3211	B 6	3232	C 4	3247	B 3	7125	B 5	7177	D 4		

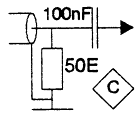
o for AM-version only
x for LW-version only
y for USA version only
z not for all versions

ECO4 VA TUNER BOARD / copper side view



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER Adjustment table (**ECO4 VA** FM/MW- and FM/MW/LW - versions with AM-frame aerial)

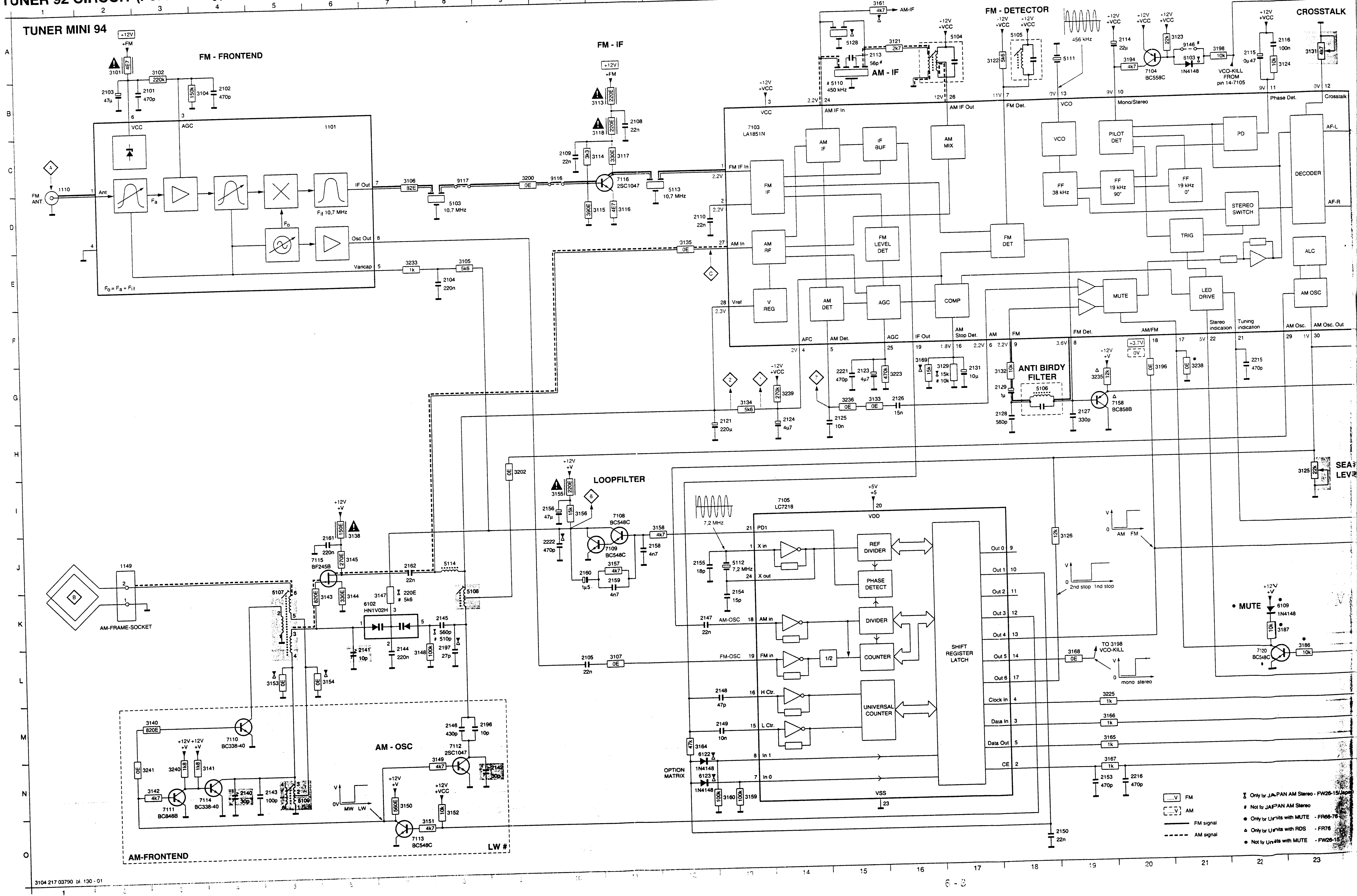
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM /00/01/05/10/17 87.5 - 108MHz			108 MHz	5120	1	8 ± 0.2V
			87.5MHz	check		4.1 ± 0.5V
FM /14 East Europe 65.81 - 108MHz			108 MHz	5120		8V ± 0.2V
			65.81 MHz	check		0.8 ± 0.4V
MW /01/17 2-band version 530 - 1710kHz			1710kHz	5123		9V ± 0.1V
			530kHz	check		1V ± 0.4V
LW /00/05/10/14 153 - 279kHz			279kHz	5122		8V ± 0.2V
			153kHz	check		1V ± 0.4V
MW /00/05/10/14 522 - 1611kHz			1611kHz	5123		8V ± 0.1V
			522kHz	check		1V ± 0.4V
FM - RF						
FM /00/01/05/10/17	108MHz	A mod=1kHz Δf=22.5kHz	108MHz	2115	3	MAX ↕
	87.5MHz		87.5MHz	5109		
FM /14 East Europe	108MHz		108MHz	2115		
	65.81MHz		65.81MHz	5109		
VCO						
FM	98 MHz, 1mV continuous wave	A	98MHz	3148	2	152 ± 1 kHz
AM - IF						
MW	540kHz Δf = 10kHz as low as possible		540kHz	5142 5140	4	symmetrical and max height
AM - RF 1)						
LW	198kHz	B mod=1kHz 30% AM	198kHz	5108	4	MAX
MW 3-band version	1494kHz		1494kHz	2113		MAX ↕
	549kHz		549kHz	5107		
MW 2-band version	1500kHz		1500kHz	2113		
	550kHz		550kHz	5107		

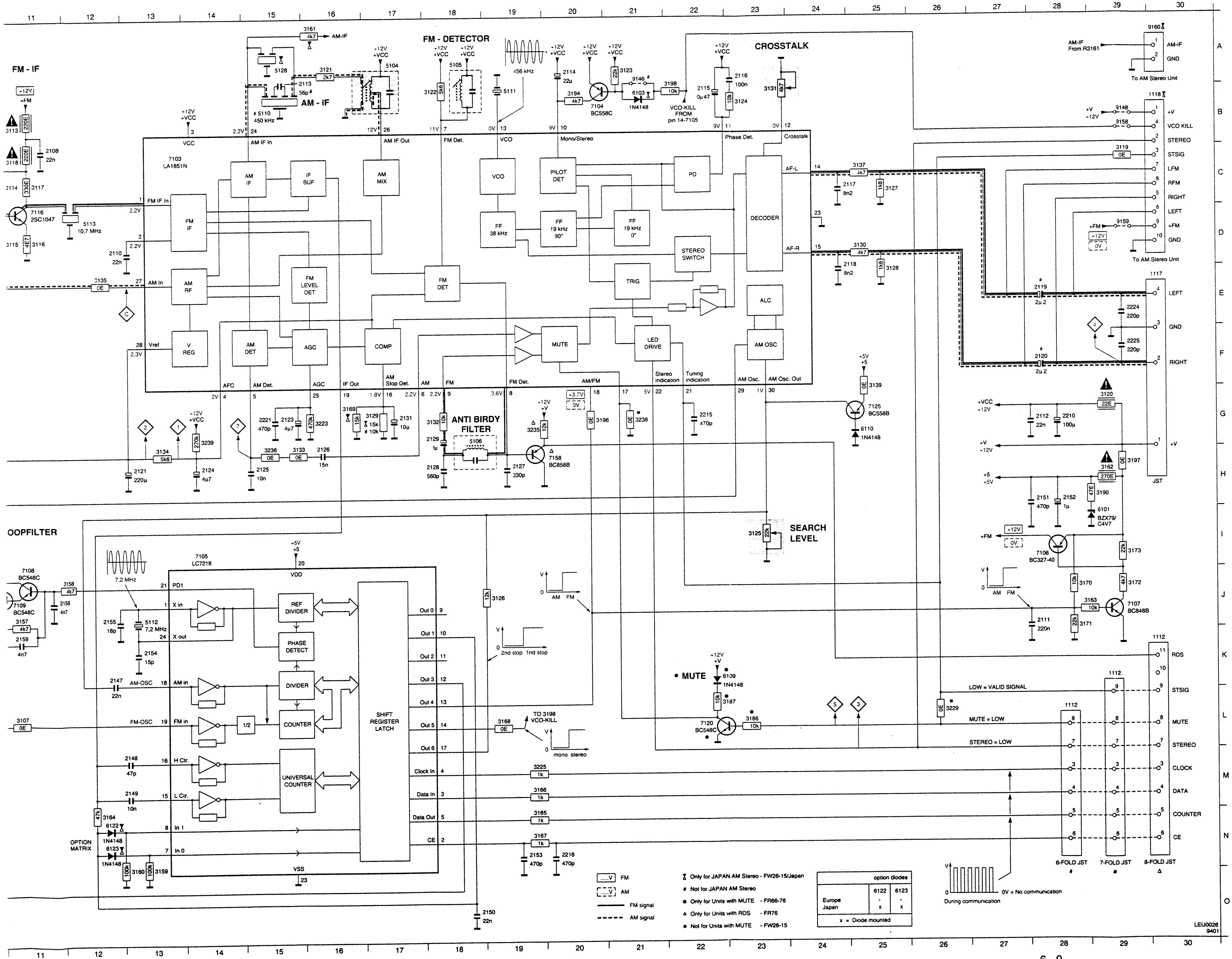
* Use Service Test Program. By selecting the TUNER TEST test frequencies will be stored as preset frequ. automatically.

1) For AM RF-adjustments the original frame antenna 4822 158 60622 has to be used!

↕ repeat

TUNER 92 CIRCUIT (For /22 only)


TUNER MINI 94
FM - FRONTEND
1101
FM ANT
1110
Ant
VCC
AGC
IF Out
Osc Out
Varicap
Fa
Fo
Fif 10,7 MHz
Fo = Fa + Fif
3101 4E7
3102 220k
2101 470p
2103 47µ
3104 150k
2102 470p
3106 82E
9117
5103 10,7 MHz
3200 0E
9116
3233 1k
3105 5k6
2104 220n
FM - IF
+12V +FM
3113 220E
3118 220E
2108 22n
2109 22n
3114 3k3
3117 330E
7116 2SC1047
3115 390E
3116 4E7
5113 10,7 MHz
2110 22n
3135 0E
AM - IF
3161 4k7 AM-IF
5128
3121 2k7
2113 56p #
5110 # 450 kHz
5104
FM - DETECTOR
5105
3122 5k6
456 kHz
5111
CROSSTALK
2114 22µ
3194 4k7
7104 BC558C
3123 22k
3146 #
6103 1N4148
3198 10k
VCO-KILL FROM pin 14-7105
2115 0µ47
2116 100n
3124 10k
3131 4k7
7103 LA1851N
FM IF In
AM In
Vref
AM IF In
AM IF Out
FM Det.
VCO
Mono/Stereo
Phase Det.
Crosstalk
AF-L
AF-R
AM IF
IF BUF
AM MIX
FM IF
AM RF
V REG
AM DET
AGC
FM LEVEL DET
COMP
FM DET
FF 38 kHz
FF 19 kHz 90°
FF 19 kHz 0°
PILOT DET
PD
DECODER
STEREO SWITCH
TRIG
MUTE
LED DRIVE
ALC
AM OSC
AFC
AM Det.
IF Out
AM Stop Det.
AM
FM
FM Det.
AM/FM
Stereo indication
Tuning indication
AM Osc.
AM Osc. Out
ANTI BIRDY FILTER
5106
3132
2129 1µ
2128 560p
2127 330p
3235 12k
7158 BC858B
3196 0E
3238 0E
2215 470p
3169
3129 15k
# 10k
2131 10µ
2221 470p
2123 4µ7
3223 470k
3236 0E
3133 0E
2126 15n
2125 10n
3134 5k6
3239 270k
2124 4µ7
2121 220µ
3202 0E
3125 22k
SEA
LEV
LOOPFILTER
3155 220E
2156 47µ
3156 15k
7108 BC548C
7109 BC548C
2222 470p
3157 4k7
2160 1µ5
2159 4n7
3158 4k7
2158 4n7
7105 LC7218
VDD
VSS
7,2 MHz
2155 18p
5112 7,2 MHz
2154 15p
PD1
X in
X out
AM in
FM in
H Ctr.
L Ctr.
REF DIVIDER
PHASE DETECT
DIVIDER
COUNTER
1/2
UNIVERSAL COUNTER
SHIFT REGISTER LATCH
Out 0
Out 1
Out 2
Out 3
Out 4
Out 5
Out 6
Clock In
Data In
Data Out
CE
In 1
In 0
2147 22n AM-OSC
2105 22n
3107 0E FM-OSC
2148 47p
2149 10n
3164 47k
6122 1N4148
6123 1N4148
OPTION MATRIX
3160 100k
3159 100k
3126 12k
2nd stop 1nd stop
3168 0E
TO 3198 VCO-KILL
mono stereo
3225 1k
3166 1k
3165 1k
3167 1k
2153 470p
2216 470p
2150 22n
MUTE
6109 1N4148
3187 10k
7120 BC548C
3186 10k
1149
AM-FRAME-SOCKET
5107
5108
5114
2161 220n
3138 150E
7115 BF245B
3145 270E
3143 820E
3144 330E
2162 22n
3147 220E # 5k6
6102 HN1V02H
2145 560p # 510p
2141 10p
2144 220n
3148 100k
2197 27p
3153 0E
3154 0E
AM-FRONTEND
3140 820E
7110 BC338-40
3241 0E
3240 1k8
3141 1k8
3142 4k7
7111 BC848B
7114 BC338-40
2140 30p
2143 100p
5109
AM - OSC
2146 430p
2196 10p
7112 2SC1047
3149 4k7
2142 30p
MW LW
3150 560E
3151 4k7
3152 10k
7113 BC548C
LW #
FM
AM
FM signal
AM signal
Only for JAPAN AM Stereo - FW26-15/Japa
# Not for JAPAN AM Stereo
● Only for Units with MUTE - FR66-76
▲ Only for Units with RDS - FR76
✱ Not for Units with MUTE - FW26-15


FM - IF
AM - IF
FM - DETECTOR
CROSSTALK
ANTI BIRDY FILTER
SEARCH LEVEL
MUTE
OOPFILTER
7103 LA1851N
7105 LC7218
VCC
AM IF In
AM IF Out
FM Det.
VCO
Mono/Stereo
Phase Det.
Crosstalk
FM IF In
AM In
Vref
AM IF
IF BUF
AM MIX
PILOT DET
PD
DECODER
FF 38 kHz
FF 19 kHz 90°
FF 19 kHz 0°
STEREO SWITCH
TRIG
ALC
FM IF
AM RF
FM LEVEL DET
FM DET
V REG
AM DET
AGC
COMP
MUTE
LED DRIVE
AM OSC
AF-L
AF-R
AFC
AM Det.
IF Out
AM Stop Det.
AM
FM
FM Det.
AM/FM
Stereo indication
Tuning indication
AM Osc.
AM Osc. Out
VDD
PD1
X in
X out
AM in
FM in
H Ctr.
L Ctr.
In 1
In 0
VSS
REF DIVIDER
PHASE DETECT
DIVIDER
1/2
COUNTER
UNIVERSAL COUNTER
SHIFT REGISTER LATCH
Out 0
Out 1
Out 2
Out 3
Out 4
Out 5
Out 6
Clock In
Data In
Data Out
CE
AM-OSC
FM-OSC
OPTION MATRIX
7.2 MHz
456 kHz
450 kHz
10,7 MHz
VCO-KILL FROM pin 14-7105
TO 3198 VCO-KILL
2nd stop 1nd stop
mono stereo
AM FM
AM-IF From R3161
To AM Stereo Unit
AM-IF
GND
+V
VCO KILL
STEREO
STSIG
LFM
RFM
RIGHT
LEFT
+FM
LEFT
GND
RIGHT
JST
RDS
STSIG
MUTE
STEREO
CLOCK
DATA
COUNTER
CE
LOW = VALID SIGNAL
MUTE = LOW
STEREO = LOW
6-FOLD JST
7-FOLD JST
8-FOLD JST
0V = No communication
During communication
LEU0026 9401

.....V FM
.....V AM
FM signal
AM signal

Ⅹ Only for JAPAN AM Stereo - FW26-15/Japan
Not for JAPAN AM Stereo
● Only for Units with MUTE - FR66-76
△ Only for Units with RDS - FR76
● Not for Units with MUTE - FW26-15

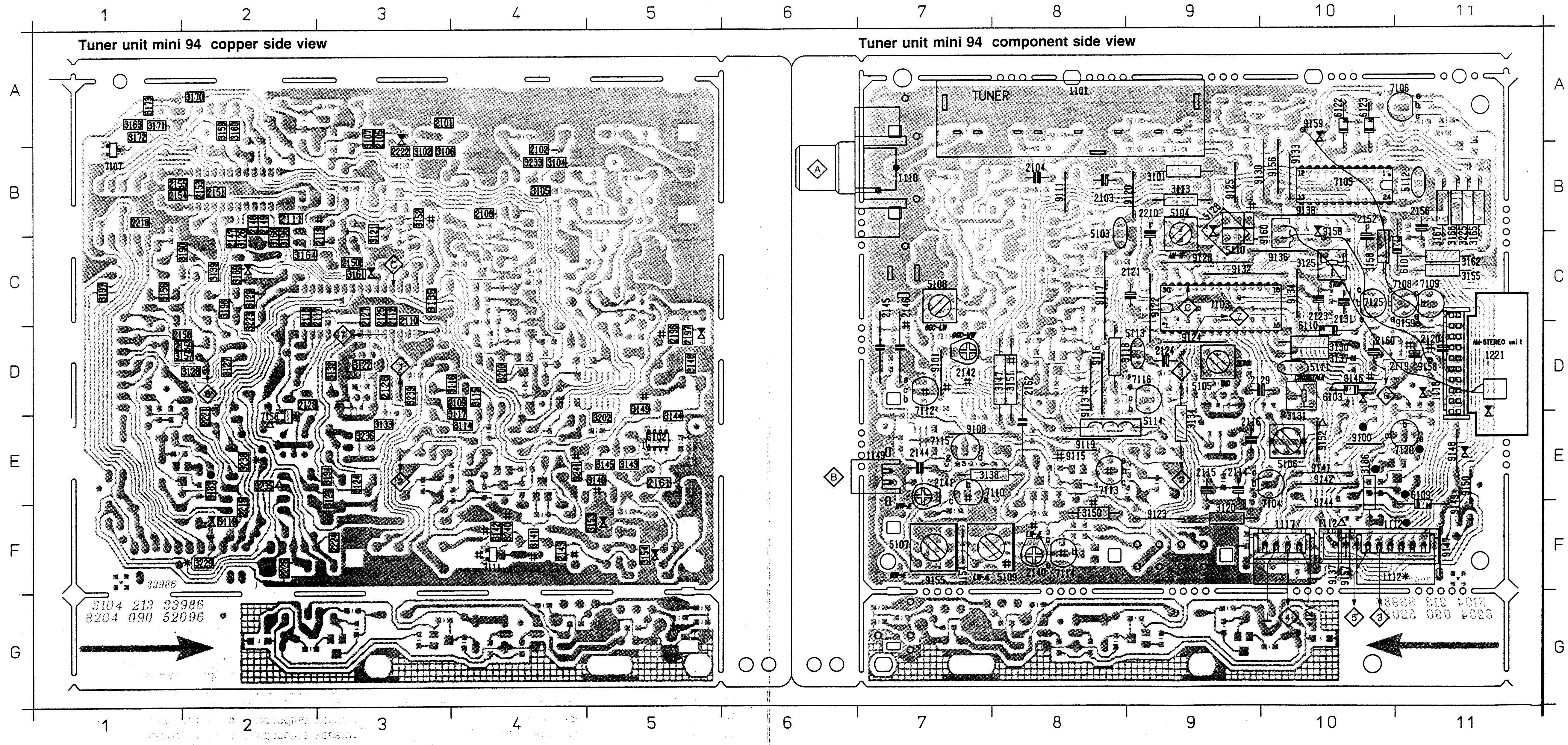
option diodes	6122	6123
Europe	-	-
Japan	x	x

x = Diode mounted

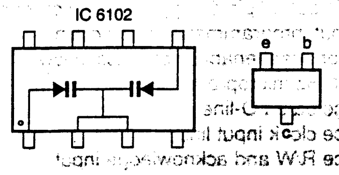
1101	B6	3165	N19
1110	C1	3166	M19
1112	L28	3167	N19
1112	K29	3168	L19
1112	K30	3169	G16
1117	E30	3170	J28
1118	B30	3171	K28
1149	J2	3172	J29
1221	A30	3173	I29
2101	B3	3186	L23
2102	B4	3187	L22
2103	B2	3190	H29
2104	E8	3194	B20
2105	L10	3196	G20
2108	B11	3197	H29
2109	C10	3198	A22
2110	D12	3200	C9
2111	J28	3202	I9
2112	G28	3223	G16
2113	A15	3225	M19
2114	A20	3229	L26
2115	B22	3233	E7
2116	A23	3235	G19
2117	C24	3236	G15
2118	D24	3238	G21
2119	E28	3239	G14
2120	F28	3240	N3
2121	H13	3241	N2
2123	G15	5103	D8
2124	H14	5104	A17
2125	H15	5105	A18
2126	G16	5106	G18
2127	H19	5107	K5
2128	H18	5108	K8
2129	G18	5109	N5
2131	G17	5110	B15
2140	N4	5111	B19
2141	L6	5112	J13
2142	N9	5113	D12
2143	N5	5114	J8
2144	L7	5128	A15
2145	K8	6101	I29
2146	M8	6102	K6
2147	K12	6103	B21
2148	M12	6109	K22
2149	M12	6110	G25
2150	O18	6122	N12
2151	H28	6123	N12
2152	H28	7103	C13
2153	N19	7104	B20
2154	K13	7105	I14
2155	J12	7106	I28
2156	I10	7107	J29
2158	J11	7108	I11
2159	K11	7109	J11
2160	J10	7110	M4
2161	J6	7111	N3
2162	J7	7112	M8
2196	M8	7113	O7
2197	L8	7114	N3
2210	G28	7115	J5
2215	G22	7116	C11
2216	N20	7120	L22
2221	G15	7125	G25
2222	J10	7158	H20
2224	E29	9116	C10
2225	F29	9117	C8
3101	A2	9146	A21
3102	A3	9148	B29
3104	B4	9158	B29
3105	E8	9159	D29
3106	C7	9160	A30
3107	L11		
3113	B11		
3114	C11		
3115	D11		
3116	D11		
3117	C11		
3118	C11		
3119	C29		
3120	G29		
3121	A16		
3122	B18		
3123	A21		
3124	B23		
3125	I23		
3126	J19		
3127	C25		
3128	E25		
3129	G17		
3130	D25		
3131	B23		
3132	G18		
3133	G15		
3134	G13		
3135	E12		
3137	C25		
3138	J6		
3139	G25		
3140	M2		
3141	N3		
3142	N2		
3143	K6		
3144	K6		
3145	J6		
3147	K7		
3148	L7		
3149	N7		
3150	N7		
3151	O7		
3152	O8		
3153	L5		
3154	L6		
3155	I10		
3156	I10		
3157	J11		
3158	J11		
3159	N13		
3160	N13		
3161	A16		
3162	H29		
3163	J28		
3164	N12		

TUNER 92 LAYOUT (For /22 only)

1101	A8	2111	B2	2128	D2	2153	B2	2224	F3	3121	B3	3138	E7	3155	C11	3171	A1	3235	E2	5113	D9	7109	C11	9115	E8	9138	B10
1110	B7	2112	C3	2129	D10	2154	B1	2225	F2	3122	D3	3139	C2	3156	C1	3172	A1	3236	E3	5114	E9	7110	E8	9116	D8	9141	E10
1112	F10	2113	B3	2131	D10	2155	B1	3101	B9	3123	E3	3140	E5	3157	D2	3173	A1	3238	E2	5128	B9	7111	F4	9117	C8	9142	E10
1112	F10	2114	E9	2140	F8	2156	B11	3102	B3	3124	E3	3141	F4	3158	C10	3186	E10	3239	D3	6101	C11	7112	E7	9119	E8	9144	F10
1112	F10	2115	E9	2141	E7	2158	D2	3104	B4	3125	C10	3142	F4	3159	A2	3187	E2	3240	F4	6102	E5	7113	E8	9120	B9	9146	D10
1117	F10	2116	E9	2142	D7	2159	D2	3105	B4	3126	C2	3143	E5	3160	A2	3190	C2	3241	E4	6103	D10	7114	F8	9122	C9	9147	F11
1118	D11	2117	C3	2143	F4	2160	D10	3106	B3	3127	D2	3144	E5	3161	C3	3194	E3	5103	C8	6109	E11	7115	E7	9123	F9	9148	E11
1149	E7	2118	C2	2144	E7	2161	E5	3107	A3	3128	D2	3145	E5	3162	C11	3196	C2	5104	B9	6110	D10	7116	D9	9124	D9	9149	F11
2101	A3	2119	D11	2145	C7	2162	D8	3113	B9	3129	C2	3147	D8	3163	A1	3197	C1	5105	D9	6122	A10	7120	E11	9125	B9	9150	E11
2102	B4	2120	D11	2146	C7	2196	D5	3114	E4	3130	D10	3148	D5	3164	C2	3198	C2	5106	E10	6123	A10	7125	C10	9128	C9	9152	E10
2103	B8	2121	C9	2147	C2	2197	D5	3115	D4	3131	E10	3149	D5	3165	C11	3200	D4	5107	F7	7103	C9	7158	E2	9130	B10	9154	F7
2104	B8	2123	C10	2148	B2	2210	B9	3116	D4	3132	D3	3150	F8	3166	C11	3202	E5	5108	C7	7104	F10	9100	E10	9132	C9	9155	F7
2105	A3	2124	D9	2149	B2	2215	F2	3117	E4	3133	E3	3151	D8	3167	C11	3223	C2	5109	F8	7105	B10	9101	D7	9133	B10	9156	B10
2108	B4	2125	C3	2150	C3	2216	B1	3118	D9	3134	E9	3152	B3	3168	C2	3225	C11	5110	C9	7106	A11	9108	E7	9134	C10	9157	F10
2109	D4	2126	D3	2151	B2	2221	E2	3119	F2	3135	C3	3153	F5	3169	C2	3229	F2	5111	D10	7107	B1	9111	B8	9136	C10		
2110	C3	2127	C3	2152	B10	2222	B3	3120	F9	3137	D10	3154	F5	3170	A2	3233	B4	5112	B11	7108	C11	9113	D8	9137	F10		


Tuner unit mini 94 copper side view

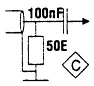
Tuner unit mini 94 component side view


IC 6102

# NOT FOR JAPAN AM-STEREO
⧗ ONLY FOR JAPAN AM-STEREO
△ ONLY FOR UNITS WITH RDS
✱ NOT FOR UNITS WITH MUTE
● ONLY FOR UNITS WITH MUTE

3104-217-03790 .6

TUNER MINI 94 Adjustment Table (FM,MW,LW with Frame antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VAPRICAP ALIGNMENT						
FM 87.5 - 108MHz (50)			108MHz	check	◇6	7 .....9V
			87.5MHz	check		1.3 ....2V
LW 153 - 279kHz (3)			279kHz	5108		8.5V ± 0.1V
			153kHz	check		0.7 ...1.5V
MW 522 - 1611kHz (9)			1611kHz	2142		8V ± 0.1V
			522kHz	check		0.7 ....1.7V
FM IF						
FM	98MHz 1mV mod = 1kHz Δf = 75kHz	◇A	98MHz	5105	◇1 ◇2	0V ± 20mV
STEREO CROSSTALK						
FM	98MHz 1mV 90% L + 9% pilot	◇A	98MHz	check	◇3	low < 1V
				3131	◇4	Right channel min.
SEARCH SENSITIVITY						
FM	98MHz 12µV mod = 1kHz Δf = 75kHz	◇A	98MHz Sensitivity low "Level"	3125	◇5	Switches just from High to Low
AM - IF						
MW	1494KHZ Δf = 10kHz low as posible swept signal		1494kHz	5104	◇7	symmerical and maxheight
AM - RF						
LW	155kHz mod = 1kHz 30% AM 270kHz	◇B *	155kHz	5109	◇7	MAX ↕
			270kHz	2140		
MW	558kHz mod = 1kHz 30% AM 1494kHz		558kHz	5107		MAX ↕
			1494kHz	2141		

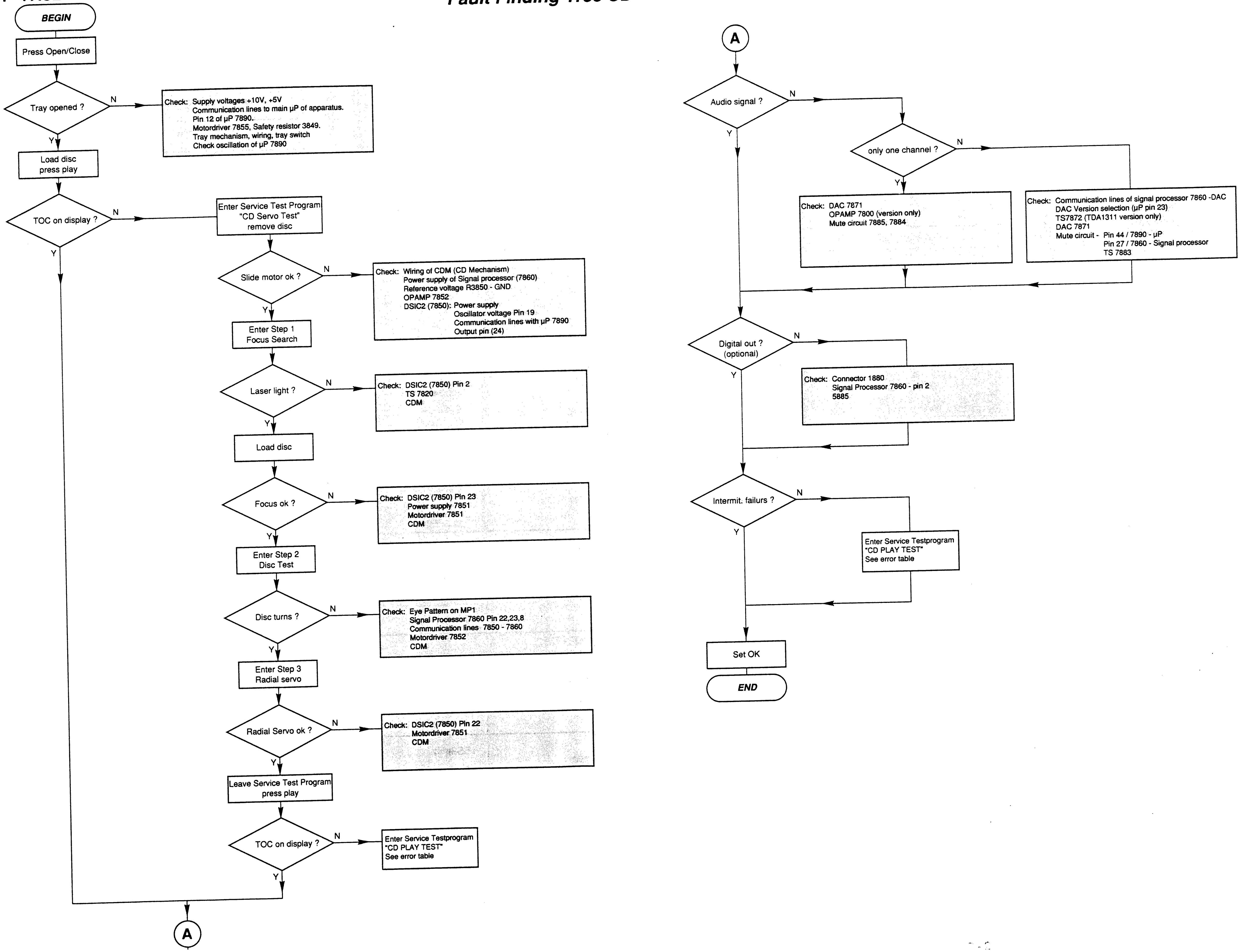
* Signal send via a frame antenna

(..) = tuning grid in kHz

↕ repeat

CD UNIT - FAULT FINDING TREE

Fault Finding Tree CD


BEGIN
Press Open/Close
Tray opened ?
N
Y
Check: Supply voltages +10V, +5V
Communication lines to main µP of apparatus.
Pin 12 of µP 7890.
Motordriver 7855, Safety resistor 3849.
Tray mechanism, wiring, tray switch
Check oscillation of µP 7890
Load disc
press play
TOC on display ?
N
Y
Enter Service Test Program
"CD Servo Test"
remove disc
Slide motor ok ?
N
Y
Check: Wiring of CDM (CD Mechanism)
Power supply of Signal processor (7860)
Reference voltage R3850 - GND
OPAMP 7852
DSIC2 (7850): Power supply
Oscillator voltage Pin 19
Communication lines with µP 7890
Output pin (24)
Enter Step 1
Focus Search
Laser light ?
N
Y
Check: DSIC2 (7850) Pin 2
TS 7820
CDM
Load disc
Focus ok ?
N
Y
Check: DSIC2 (7850) Pin 23
Power supply 7851
Motordriver 7851
CDM
Enter Step 2
Disc Test
Disc turns ?
N
Y
Check: Eye Pattern on MP1
Signal Processor 7860 Pin 22,23,8
Communication lines 7850 - 7860
Motordriver 7852
CDM
Enter Step 3
Radial servo
Radial Servo ok ?
N
Y
Check: DSIC2 (7850) Pin 22
Motordriver 7851
CDM
Leave Service Test Program
press play
TOC on display ?
N
Y
Enter Service Testprogram
"CD PLAY TEST"
See error table
A
A
Audio signal ?
N
Y
only one channel ?
N
Y
Check: DAC 7871
OPAMP 7800 (version only)
Mute circuit 7885, 7884
Check: Communication lines of signal processor 7860 -DAC
DAC Version selection (µP pin 23)
TS7872 (TDA1311 version only)
DAC 7871
Mute circuit - Pin 44 / 7890 - µP
Pin 27 / 7860 - Signal processor
TS 7883
Digital out ?
(optional)
N
Y
Check: Connector 1880
Signal Processor 7860 - pin 2
5885
Intermit. failurs ?
N
Y
Enter Service Testprogram
"CD PLAY TEST"
See error table
Set OK
END

Abbreviations CD

DSIC2

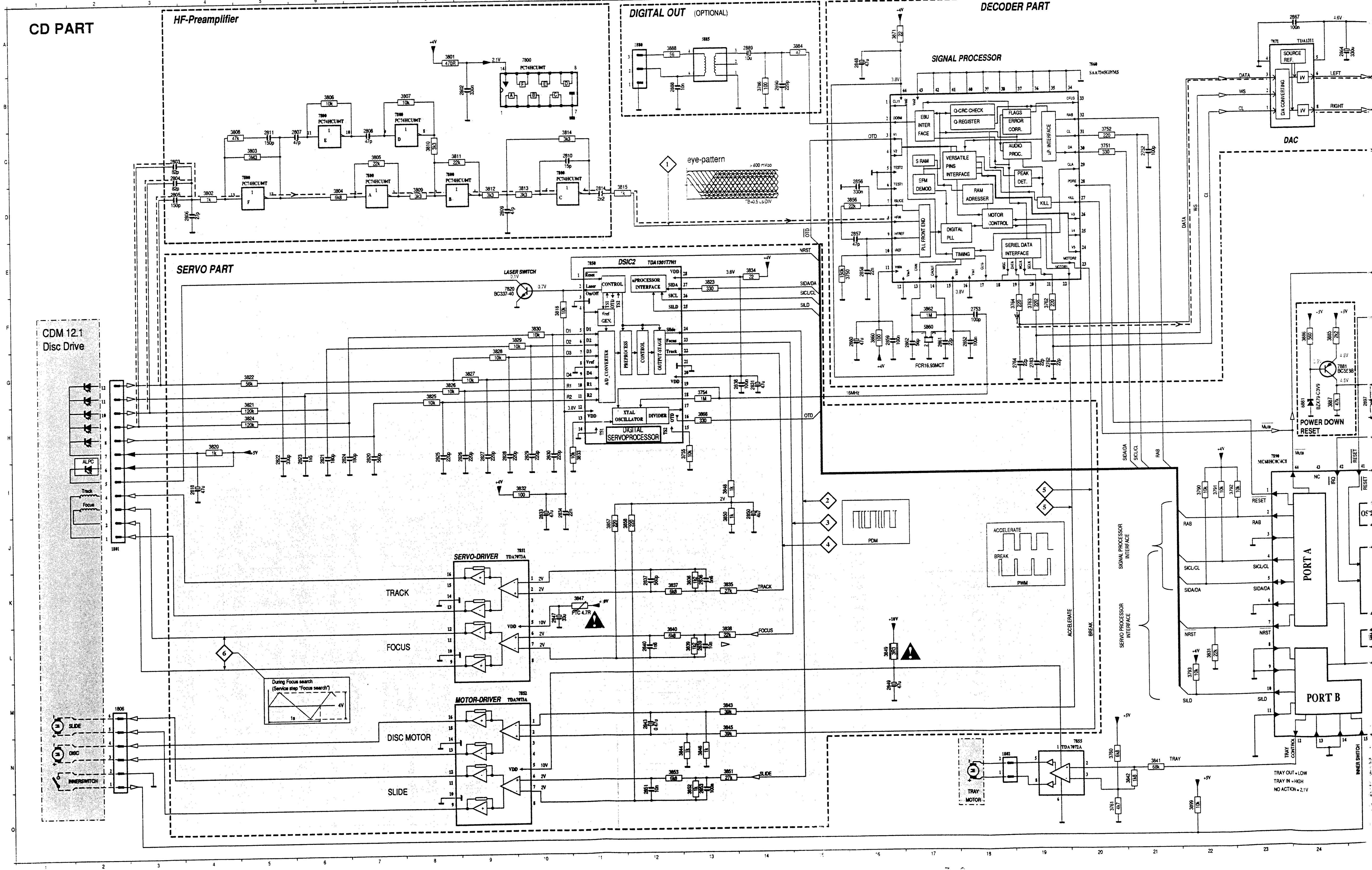
Pin	Name	Direction	Description
1	RESET	µP -> DSIC2	Reset input
2	Laser On/Of	DSIC -> Laser switch	Switches Laser on/off
3	Gnd	Gnd	Ground (Analog part)
4	VRH	not connected	Reference input for A/D converter
5	D1	Diode array -> DSIC2	Unipolar current input (Central diode signal input)
6	D2	Diode array -> DSIC2	Unipolar current input (Central diode signal input)
7	D3	Diode array -> DSIC2	Unipolar current input (Central diode signal input)
8	Vref	Gnd	Reference input for A/D converter
9	D4	Diode array -> DSIC2	Unipolar current input (Central diode signal input)
10	R1	Diode array -> DSIC2	Unipolar current input (Satelite diode signal input)
11	R2	Diode array -> DSIC2	Unipolar current input (Satelite diode signal input)
12	VDD		Supply for DSIC2 (Analog part)
13			
14	TS1	Gnd	Test input 1
15	TS2	Gnd	Test input 2
16	OTD	DSIC2 -> Signal Processor	Off Track Detection
17	CLO	not connected	Clock output
18	XTLO		Oscillator output
19	XTLI		Oscillator input
20	VDD		Supply for DSIC2 (Digital part)
21	Gnd		Ground (Digital part)
22	Track	DSIC2 -> Servo Driver	Radial actuator output
23	Focus	DSIC2 -> Servo Driver	Focus actuator output
24	Slide	DSIC2 -> Motor Driver	Sledge output
25	SILD	µP -> DSIC2	Serial Interface Load
26	SICL	µP -> DSIC2	Serial Interface Clock
27	SIDA	µP <-> DSIC2	Serial Interface Data
28	VDD		Supply for DSIC2 (Digital part)

SIGNAL PROCESSOR

Pin	Name	Direction	Description
1	CL11	not connected	11.2896MHz clock output (3-state)
2	DOMB	signal processor -> Digital out	digital bi-phase mark output (3-state)
3	V1	DSIC2 -> signal processor	versatile input pin of signal processor
4	V2	not connected	versatile input pin of signal processor
5	Test2	GND	test input of signal processor
6	Test1	GND	test input of signal processor
7	ISLICE	signal processor ->	current feedback from internal data slicer
8	HFIN	HF Pre-amp -> signal processor	comparator signal input
9	HFREF	HF Pre-amp -> signal processor	comparator signal input
10	IREF	-> signal processor	reference current pin (nom. VDD/2)
11	VDDA		supply (analog) of signal processor
12	VSSA		supply (analog) of signal processor
13	CRIN	X-Tal -> signal processor	crystal/resonator input of signal processor
14	CROUT	signal processor -> X-Tal	crystal/resonator output of signal processor
15	VDD1		supply for I/O-buffers of signal processor
16	VSS1		supply for I/O-buffers of signal processor
17	CL16	not connected	16.9344MHz clock output of signal processor
18	MISC	not connected	general purpose DAC output (3-state)
19	DATA	signal processor -> DAC	serial data output of signal processor (3-state)
20	WCLK	signal processor -> DAC	word clock output of signal processor (3-state)
21	SCLK	signal processor -> DAC	serial bit clock output of signal processor (3-state)
22	MOTOR1	signal processor -> Motor driver	motor output1 of signal processor; versatile (3-state)
23	MOTOR2	signal processor -> Motor driver	motor output2 of signal processor; versatile (3-state)
24	V5	not connected	versatile output pin of signal processor
25	V4	not connected	versatile output pin of signal processor
26	V3	not connected	versatile output pin of signal processor (open drain)
27	KILL	signal processor -> Mute circuit	kill output; programmable (open drain)
28	PORE	µP -> signal processor	power-on reset enable input (active low)
29	CLA	not connected	4.2336MHz microprocessor clock output
30	DA	µP <-> signal processor	interface data I/O-line
31	CL	µP -> signal processor	interface clock input line
32	RAB	µP -> signal processor	interface R/W and acknowledge input
33	CFLG	signal processor ->	correction flag output (open drain)
43	VSS2		digital supply for internal logic of signal processor
44	VDD2		digital supply for internal logic of signal processor

CD CIRCUIT

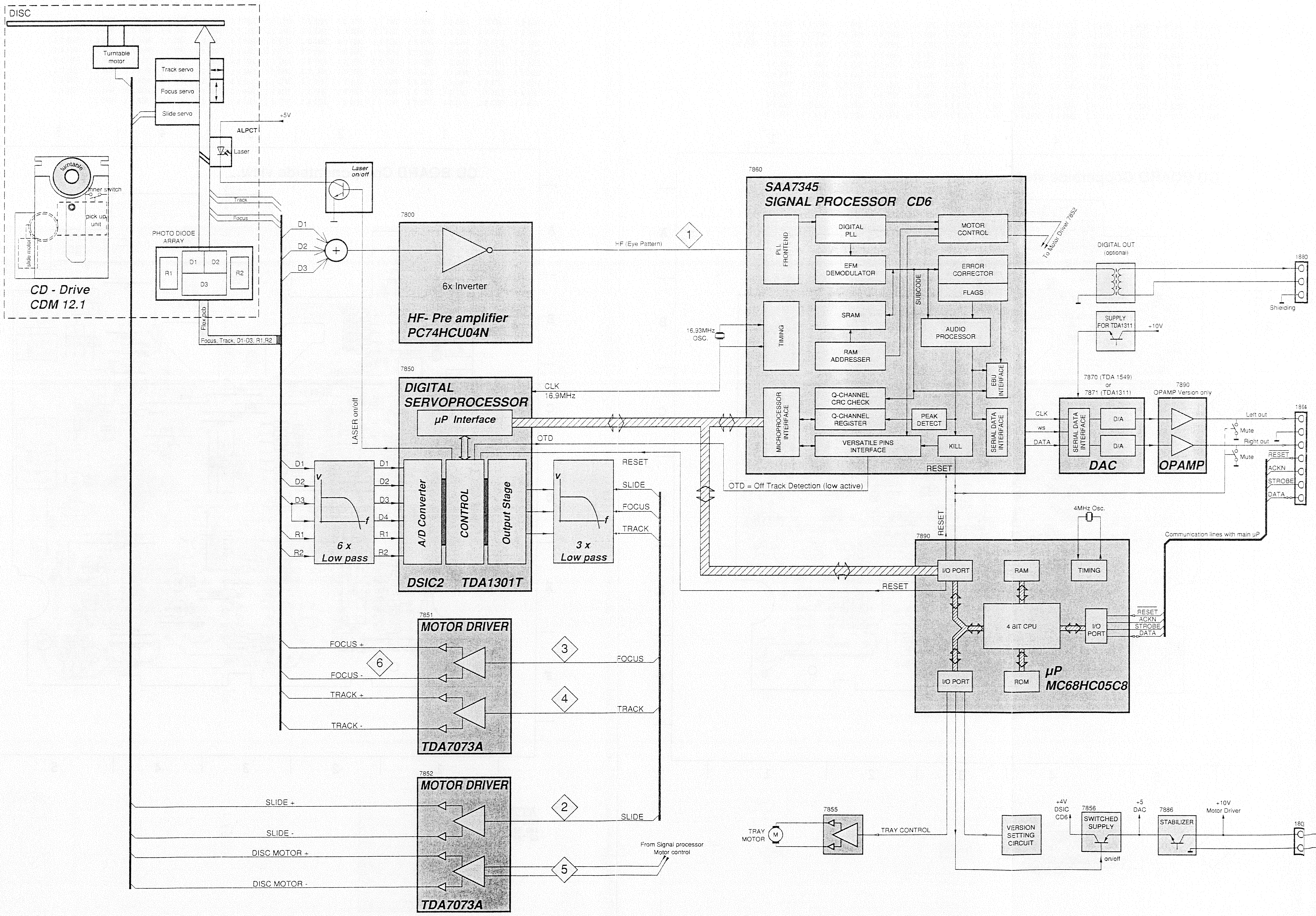
1801	J2
1802	N18
1804	F32
1805	G32
1806	O2
1810	J30
1820	J30
1880	A12
2752	C21
2753	F18
2762	G19
2763	G19
2764	G19
2769	B26
2770	D26
2802	B9
2803	C3
2804	C3
2805	D3
2806	D4
2807	C6
2808	C7
2809	D9
2810	C11
2811	C5
2814	D11
2818	I4
2820	H7
2821	H6
2822	H5
2823	H6
2824	H6
2825	H8
2826	H9
2827	H9
2828	H9
2829	H10
2830	H10
2831	H14
2833	J10
2834	J10
2836	K13
2837	K12
2838	H14
2839	L13
2840	L12
2843	M12
2847	L10
2848	A16
2849	M16
2850	J14
2851	O12
2852	G18
2853	O13
2854	F32
2856	D16
2857	E16
2858	E16
2859	F16
2860	F16
2861	G17
2862	G17
2864	A25
2866	A25
2867	A24
2876	E29
2877	B29
2878	E31
2879	B31
2881	G29
2883	G30
2888	B12
2889	A14
2890	B14
2891	H27
2892	H28
2893	O30
2894	O30
2895	O30
2897	H25
3750	E16
3751	C20
3752	C20
3754	G13
375	
376	
376	
376	



CD PART
HF-Preamplifier
DIGITAL OUT (OPTIONAL)
DECODER PART
SIGNAL PROCESSOR
SAA7345GP/M5
DAC
TDA1311
SOURCE REF.
DA CONVERTING
LEFT
RIGHT
DATA
WS
CL
SERVO PART
DSIC2
TDA1301T/N1
LASER SWITCH
BC337-40
CONTROL
μPROCESSOR INTERFACE
A/D CONVERTER
PREPROCESS
OUTPUT STAGE
XTAL OSCILLATOR
DIVIDER
DIGITAL SERVOPROCESSOR
CDM 12.1 Disc Drive
ALPC
Track
Focus
eye-pattern
PC74HCU04T
SERVO-DRIVER
TDA7073A
TRACK
FOCUS
PTC 4.7R
MOTOR-DRIVER
TDA7073A
DISC MOTOR
SLIDE
DISC
INNERSWITCH
During Focus search (Service step "Focus search")
PDM
ACCELERATE
BREAK
PWM
EBU INTERFACE
Q-CRC CHECK
Q-REGISTER
FLAGS
ERROR CORR.
AUDIO PROC.
μP INTERFACE
S RAM
VERSATILE PINS INTERFACE
PEAK DET.
EFM DEMOD
RAM ADRESSER
KILL
MOTOR CONTROL
PLL FRONT END
DIGITAL PLL
TIMING
SERIEL DATA INTERFACE
FCR16.93MCT
15MHz
SIGNAL PROCESSOR INTERFACE
SERVO PROCESSOR INTERFACE
PORT A
PORT B
MC68HC...
RESET
RAB
SICL/CL
SIDA/DA
NRST
SILD
POWER DOWN RESET
BC558B
BZX79-C3V9
TDA7072A
TRAY MOTOR
TRAY
TRAY OUT = LOW
TRAY IN = HIGH
NO ACTION = 2.1V
INNER SWITCH

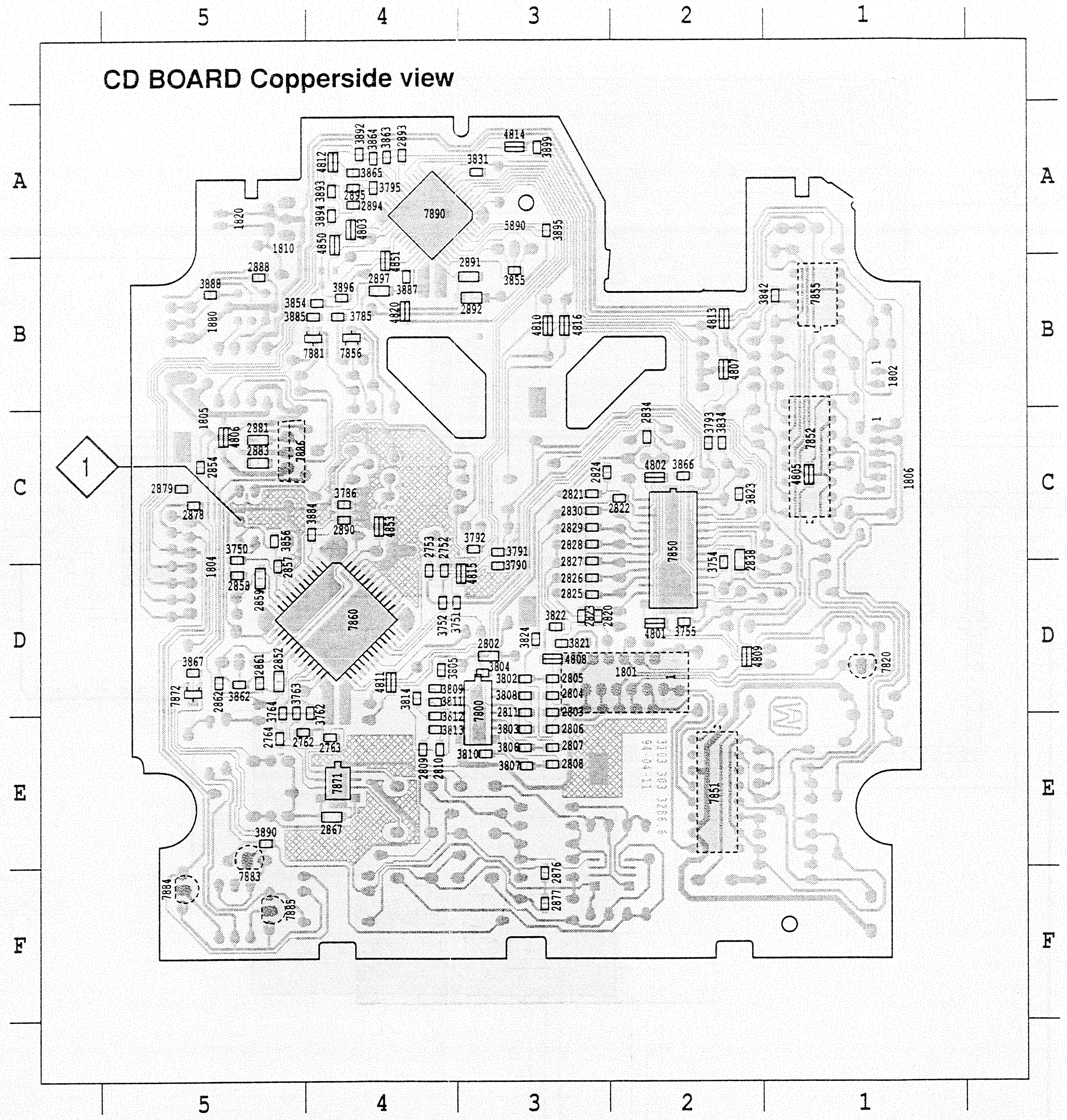
CD UNIT - BLOCK DIAGRAM

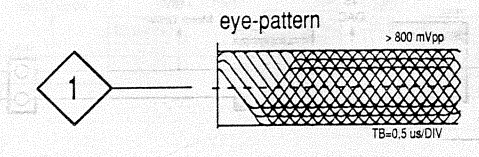
BLOCKDIAGRAM CD Module


DISC
Turntable motor
Track servo
Focus servo
Slide servo
+5V
ALPCT
Laser
Laser on/off
Turntable
Inner switch
pick up unit
Slide motor
PHOTO DIODE ARRAY
D1
D2
D3
R1
R2
CD - Drive
CDM 12.1
Flex pcb
Focus, Track, D1-D3, R1,R2
Track
Focus
7800
6x Inverter
HF- Pre amplifier
PC74HCU04N
HF (Eye Pattern)
1
7860
SAA7345
SIGNAL PROCESSOR CD6
PLL FRONTEND
DIGITAL PLL
MOTOR CONTROL
To Motor Driver 7852
EFM DEMODULATOR
ERROR CORRECTOR
FLAGS
SUBCODE
SRAM
RAM ADDRESSER
TIMING
AUDIO PROCESSOR
EBU INTERFACE
16,93MHz OSC.
MICROPROCESSOR INTERFACE
Q-CHANNEL CRC CHECK
Q-CHANNEL REGISTER
PEAK DETECT
VERSATILE PINS INTERFACE
KILL
SERIAL DATA INTERFACE
RESET
DIGITAL OUT (optional)
1880
Shielding
SUPPLY FOR TDA1311
+10V
7870 (TDA 1549) or 7871 (TDA1311)
7890 OPAMP Version only
1804
CLK
WS
DATA
SERIAL DATA INTERFACE
D/A
D/A
DAC
OPAMP
Left out
Mute
Right out
Mute
RESET
ACKN
STROBE
DATA
7850
DIGITAL SERVOPROCESSOR
µP Interface
CLK 16.9MHz
OTD
OTD = Off Track Detection (low active)
LASER on/off
D1
D2
D3
R1
R2
6 x Low pass
D1
D2
D3
D4
R1
R2
A/D Converter
CONTROL
Output Stage
3 x Low pass
RESET
SLIDE
FOCUS
TRACK
DSIC2 TDA1301T
4MHz Osc.
Communication lines with main µP
7890
I/O PORT
RAM
TIMING
RESET
4 BIT CPU
I/O PORT
RESET
ACKN
STROBE
DATA
I/O PORT
ROM
µP
MC68HC05C8
7851
MOTOR DRIVER
FOCUS +
6
FOCUS -
TRACK +
TRACK -
3
FOCUS
4
TRACK
TDA7073A
7852
MOTOR DRIVER
SLIDE +
SLIDE -
DISC MOTOR +
DISC MOTOR -
2
SLIDE
5
From Signal processor Motor control
TDA7073A
TRAY MOTOR
M
7855
TRAY CONTROL
VERSION SETTING CIRCUIT
+4V DSIC CD6
7856
SWITCHED SUPPLY
on/off
+5 DAC
7886
STABILIZER
+10V Motor Driver
1801
+CD
GND

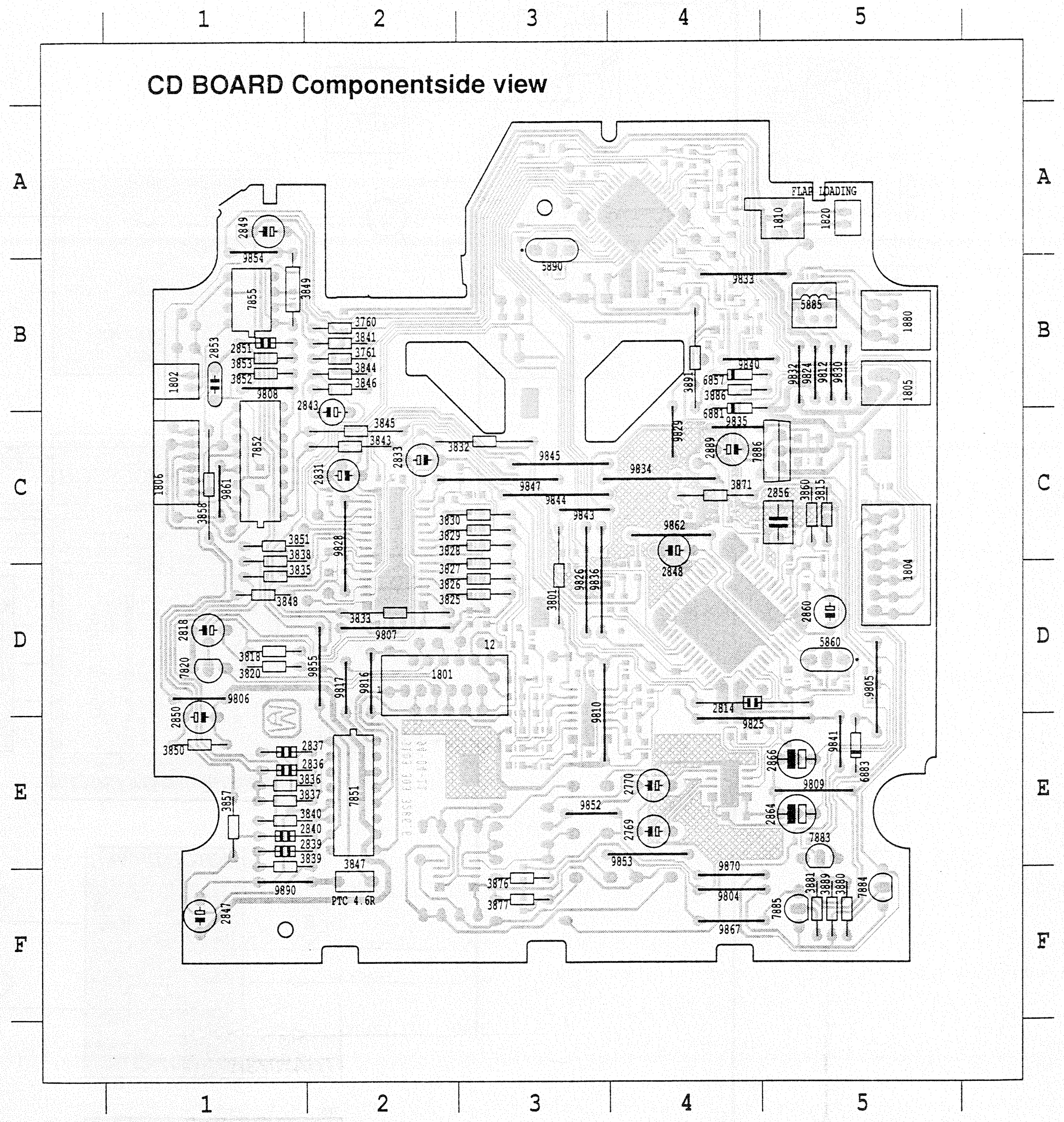
CD LAYOUT

MP1 C 5	2806 E 3	2824 C 3	2854 C 5	2879 C 5	2897 B 4	3786 C 4	3805 D 4	3821 D 3	3862 D 5	3890 E 5	4803 A 4	4815 D 3	7872 D 5
2752 D 4	2807 E 3	2825 D 3	2857 D 5	2881 C 5	3750 C 5	3790 D 3	3806 E 3	3822 D 3	3863 A 4	3892 A 4	4805 C 1	4816 B 3	7881 B 4
2753 D 4	2808 E 3	2826 D 3	2858 D 5	2883 C 5	3751 D 4	3791 C 3	3807 E 3	3823 C 2	3864 A 4	3893 A 4	4806 C 5	4820 B 4	7890 A 4
2762 E 5	2809 E 4	2827 D 3	2859 D 5	2888 B 5	3752 D 4	3792 C 3	3808 D 3	3824 D 3	3865 A 4	3894 A 4	4808 D 3	4850 A 4	
2763 E 4	2810 E 4	2828 C 3	2861 D 5	2890 C 4	3754 D 2	3793 C 2	3809 D 4	3831 A 3	3866 C 2	3895 A 3	4809 D 2	4851 B 4	
2764 E 5	2811 D 3	2829 C 3	2862 D 5	2891 B 3	3755 D 2	3794 B 4	3810 E 3	3834 C 2	3867 D 5	3896 B 4	4810 B 3	7800 D 3	
2802 D 3	2820 D 3	2830 C 3	2867 E 4	2892 B 3	3762 D 4	3795 A 4	3811 D 4	3842 B 1	3884 C 4	3897 B 4	4811 D 4	7850 C 2	
2803 D 3	2821 C 3	2834 C 2	2876 F 3	2893 A 4	3763 D 5	3802 D 3	3812 E 4	3854 B 4	3885 B 4	3899 A 3	4812 A 4	7856 B 4	
2804 D 3	2822 C 2	2838 C 2	2877 F 3	2894 A 4	3764 D 5	3803 E 3	3813 E 4	3855 B 3	3887 B 4	4801 D 2	4813 B 2	7860 D 4	
2805 D 3	2823 D 3	2852 D 5	2878 C 5	2895 A 4	3785 B 4	3804 D 3	3814 D 4	3856 C 5	3888 B 5	4802 C 2	4814 A 3	7871 E 4	


CD BOARD Copperside view
5
4
3
2
1
A
B
C
D
E
F
1
7890
7860
7850
7851
7800
7852
7855
1801
1802
1804
1805
1806
1810
1820
1880

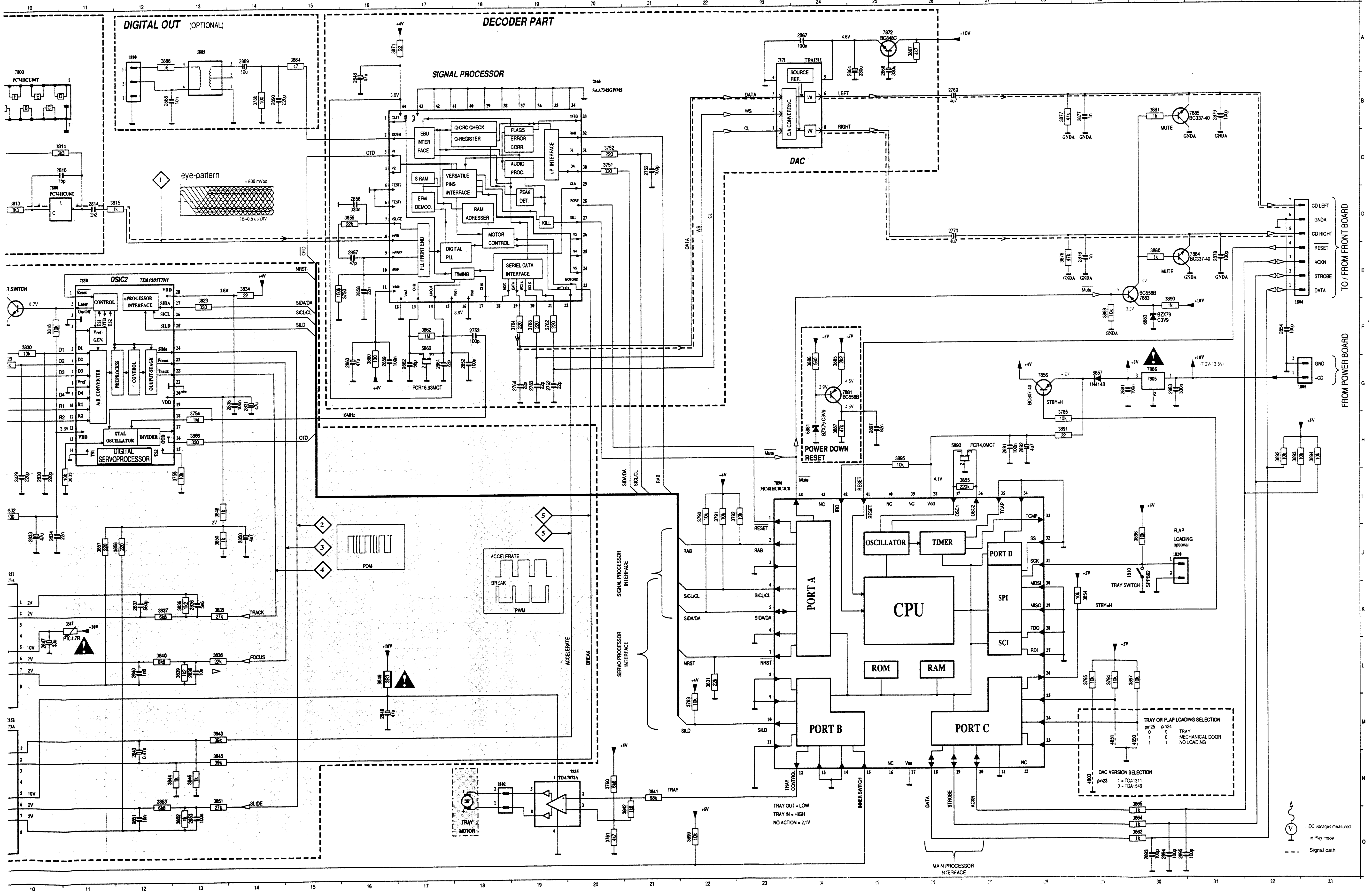


2864 E 5	1880 B 5	2839 E 1	2856 C 5	3801 D 3	3830 C 3	3841 B 2	3851 C 1	3880 F 5	6881 C 4	7886 C 5	9816 D 2	9833 B 4	9847 C 3
2866 E 5	2769 E 4	2840 E 1	2860 D 5	3815 C 5	3832 C 3	3843 C 2	3852 B 1	3881 F 5	6883 E 5	9804 F 4	9817 D 2	9834 C 4	9852 E 3
1801 D 2	2770 E 4	2843 C 2	2864 E 5	3818 D 1	3833 D 2	3844 B 2	3853 B 1	3886 B 4	7820 D 1	9805 D 5	9824 B 5	9835 C 4	9853 E 4
1802 B 1	2814 D 4	2847 F 1	2866 E 5	3820 D 1	3835 D 1	3845 C 2	3857 E 1	3889 F 5	7851 E 2	9806 D 1	9825 E 4	9836 D 3	9854 A 1
1804 D 5	2818 D 1	2848 C 4	2889 C 4	3825 D 3	3836 E 1	3846 B 2	3858 C 1	3891 B 4	7852 C 1	9807 D 2	9826 D 3	9840 B 4	9855 D 2
1805 B 5	2831 C 2	2849 A 1	3760 B 2	3826 D 3	3837 E 1	3847 F 2	3860 C 5	5860 D 5	7855 B 1	9808 B 1	9828 C 2	9841 E 5	9861 C 1
1806 C 1	2833 C 2	2850 E 1	3761 B 2	3827 D 3	3838 C 1	3848 D 1	3871 C 4	5885 B 5	7883 E 5	9809 E 5	9829 C 4	9843 C 3	9862 C 4
1810 A 5	2836 E 1	2851 B 1	3767 F 4	3828 C 3	3839 E 1	3849 B 1	3876 F 3	5890 A 3	7884 F 5	9810 D 3	9830 B 5	9844 C 3	9890 F 1
1820 A 5	2837 E 1	2853 B 1	3770 F 4	3829 C 3	3840 E 1	3850 E 1	3877 F 3	6857 B 4	7885 F 5	9812 B 5	9832 B 5	9845 C 3	

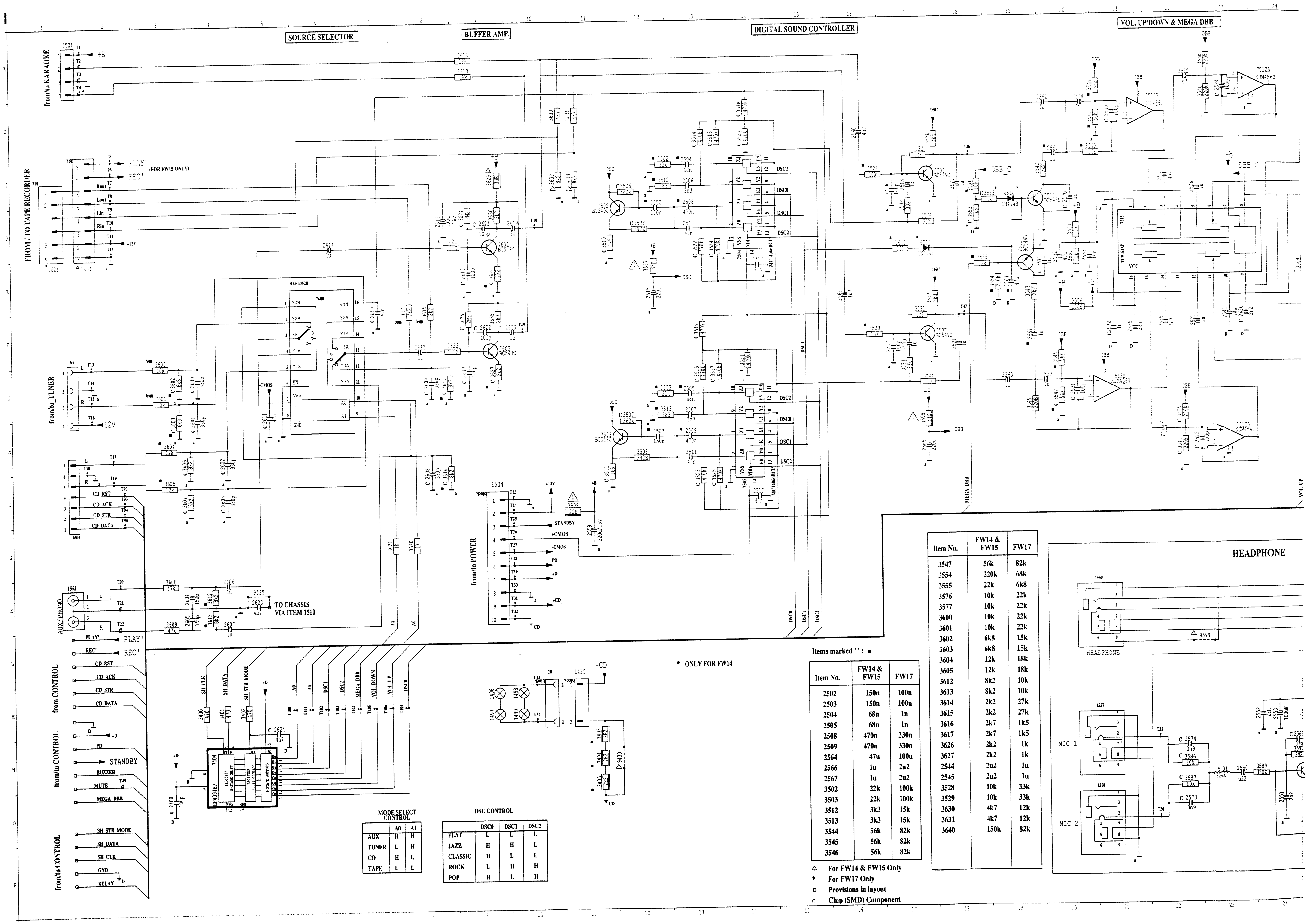

CD BOARD Componentside view
1
2
3
4
5
A
B
C
D
E
F
FLAP LOADING
PTC 4 6R
1801
1802
1804
1805
1806
1810
1820
1880
7851
7852
7855

ATTENTION:
WIRE-BRIDGE 9804,9824
AND 9829 MUST BE CONNECT
ON THE SHIELDINGGROUND!

25	H8
26	H9
27	H9
28	H9
2829	H10
2830	H10
2831	H14
2833	J10
2834	J10
2836	K13
2837	K12
2838	H14
2839	L13
2840	L12
2843	M12
2847	L10
2848	A16
2849	M16
2850	J14
2851	O12
2852	G18
2853	O13
2854	F32
2856	D16
2857	E16
2858	E16
2859	F16
2860	F16
2861	G17
2862	G17
2864	A25
2866	A25
2867	A24
2876	E29
2877	B29
2878	E31
2879	B31
2881	G29
2883	G30
2888	B12
2889	A14
2890	B14
2891	H27
2892	H28
2893	O30
2894	O30
2895	O30
2897	H25
3750	E16
3751	C20
3752	C20
3754	G13
3755	H13
3760	N20
3761	O20
3762	F19
3763	F19
3764	F19
3767	A29
3770	D29
3785	H28
3786	B14
3790	I22
3791	I22
3792	I22
3793	M22
3794	L29
3795	L29
3801	A8
3802	D4
3803	C5
3804	D6
3805	C7
3806	B6
3807	B8
3808	C5
3809	D8
3810	C8
3811	C9
3812	D9
3813	D10
3814	C11
3815	D12
3818	F10
3820	H4
3821	H5
3822	G5
3823	E13
3824	H5
3825	G8
3826	G8
3827	G9
3828	G9
3829	F10
3830	F10
3831	L22
3832	I10
3833	H11
3834	E14
3835	K13
3836	K13
3837	K12
3838	L13
3839	L13
3840	L12
3841	N21
3842	N21
3843	M13
3844	N12
3845	N13
3846	N13
3847	K11
3848	I13
3849	L16
3850	J13
3851	N13
3852	O13
3853	N12
3854	K29
3855	I27
3856	D16
3857	J11
3858	J12
3860	F16
3862	F17
3863	O30
3864	O30
3865	O30
3866	H13
3867	A26
3871	A16
3876	E28
3877	B28
3880	E30
3881	B30
3884	A15
3885	G24
3886	G24
3887	H24
3888	A12
3889	F29
3890	F30
3891	H28
3892	H32
3893	H32
3894	H33
3895	H25
3896	J30
3897	L30
3899	O22
4803	N29
4850	M30
4851	M29
5860	F17
5885	A13
5890	H26
6857	G29
6881	H24
6883	F30
7800	D5
7800	B7
7800	B6
7800	C10
7800	C8
7800	C7
7820	E10
7850	E11
7851	J9
7852	N9
7855	N20
7856	G28
7860	B20
7871	A23
7872	C24
7880	D27
7880	A27
7881	G24
7883	O30
7884	E31
7885	B31
7886	G30
7890	I23


DIGITAL OUT (OPTIONAL)
DECODER PART
SIGNAL PROCESSOR
SAA7345GP/M5
DAC
TDA1311
SOURCE REF.
DA CONVERTING
LEFT
RIGHT
DATA
WS
CL
eye-pattern
800 mVpp
TB=0.5 us/DIV
DSIC2
TDA1301T/N1
DIGITAL SERVOPROCESSOR
CONTROL
µPROCESSOR INTERFACE
Vref GEN.
A/D CONVERTER
PREPROCESS
OUTPUT STAGE
XTAL OSCILLATOR
DIVIDER
EBU INTERFACE
Q-CRC CHECK
Q-REGISTER
FLAGS ERROR CORR.
AUDIO PROC.
µP. INTERFACE
S RAM
VERSATILE PINS INTERFACE
EFM DEMOD.
RAM ADRESSER
PEAK DET
KILL
MOTOR CONTROL
PLL FRONT END
DIGITAL PLL
TIMING
SERIEL DATA INTERFACE
FCR16,93MCT
16MHz
PDM
ACCELERATE
BREAK
PWM
TRACK
FOCUS
SLIDE
PTC 4.7R
TRAY MOTOR
TDA7072A
TRAY
TRAY OUT = LOW
TRAY IN = HIGH
NO ACTION = 2,1V
POWER DOWN RESET
MC68HC0C4CB
PORT A
PORT B
PORT C
PORT D
CPU
OSCILLATOR
TIMER
SPI
SCI
ROM
RAM
SIGNAL PROCESSOR INTERFACE
SERVO PROCESSOR INTERFACE
MAIN PROCESSOR INTERFACE
FLAP LOADING optional
TRAY SWITCH
STBY=H
TRAY OR FLAP LOADING SELECTION
pin25 pin24
0 0 TRAY
1 0 MECHANICAL DOOR
1 1 NO LOADING
DAC VERSION SELECTION
pin23 1 = TDA1311
0 = TDA1549
MUTE
BC337-40
BC848C
BC558B
BZX79 C3V9
BC807-40
1N4148
7805
CD LEFT
GNDA
CD RIGHT
RESET
ACKN
STROBE
DATA
TO / FROM FRONT BOARD
GND
+CD
FROM POWER BOARD
FCR4,0MCT
INNER SWITCH
TRAY CONTROL
DC voltages measured in Play mode
Signal path

COMBI CIRCUIT I


SOURCE SELECTOR
BUFFER AMP.
DIGITAL SOUND CONTROLLER
VOL. UP/DOWN & MEGA DBB
HEADPHONE
from/to KARAOKE
FROM / TO TAPE RECORDER
from/to TUNER
AUX/PHONO
from/to POWER
from CONTROL
from/to CONTROL
from/to CONTROL
HEF4052B
7600
7404
EF4094BP
MC14066BCP
TC9153AP
NJM4560
PLAY'
REC'
(FOR FW15 ONLY)
Rout
Lout
Lin
Rin
CD RST
CD ACK
CD STR
CD DATA
STANDBY
+CMOS
-CMOS
PD
+D
+CD
+12V
+B
12V
BUZZER
MUTE
MEGA DBB
SH STR MODE
SH DATA
SH CLK
GND
RELAY
DSC0
DSC1
DSC2
VOL UP
VOL DOWN
DBB
DBB_C
A0
A1
TO CHASSIS
VIA ITEM 1510
MIC 1
MIC 2
• ONLY FOR FW14

MODE SELECT CONTROL

	A0	A1
AUX	H	H
TUNER	L	H
CD	H	L
TAPE	L	L

DSC CONTROL

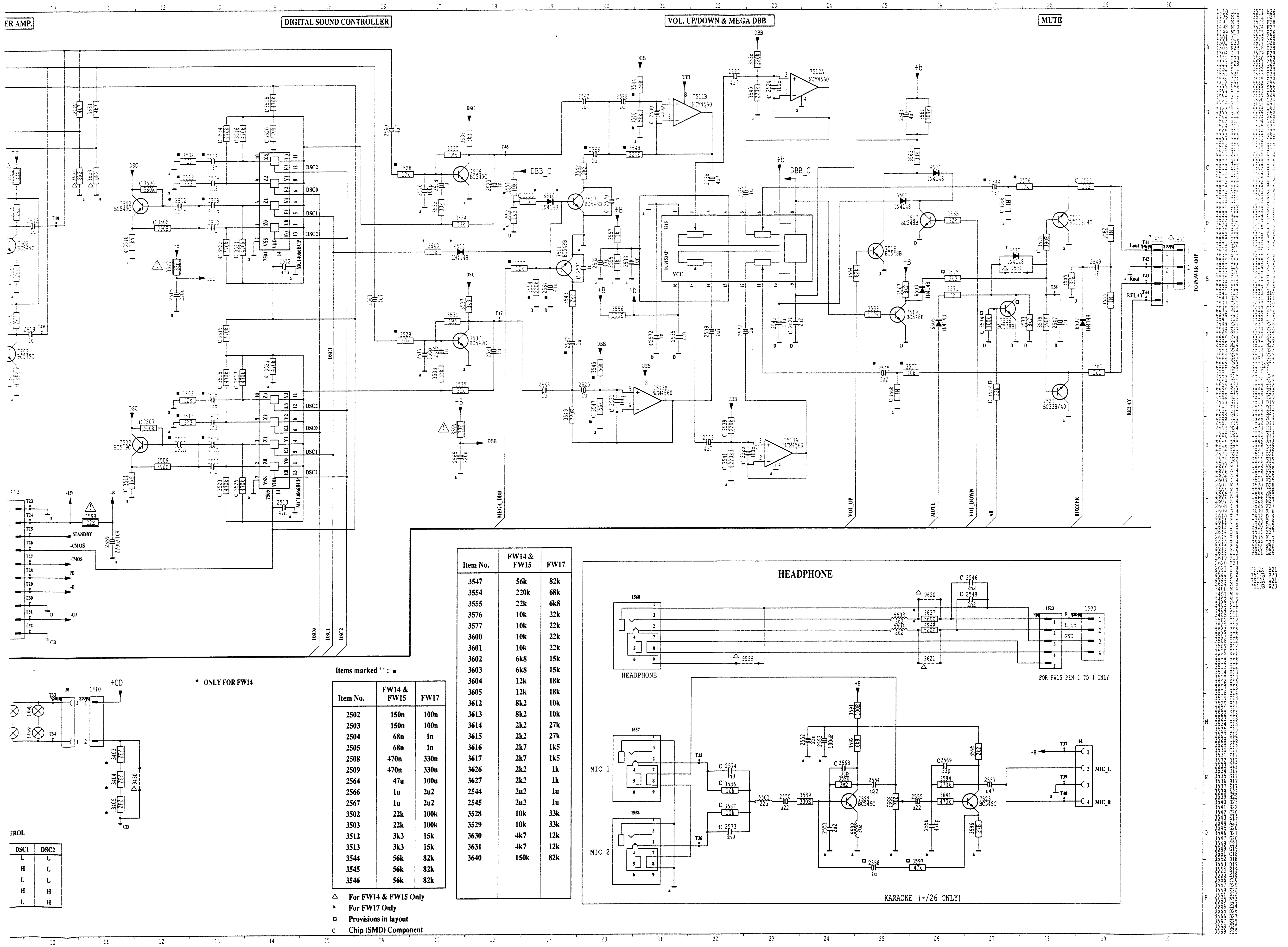
	DSC0	DSC1	DSC2
FLAT	L	L	L
JAZZ	H	H	L
CLASSIC	H	L	L
ROCK	L	H	H
POP	H	L	H

Items marked ' ' : ■

Item No.	FW14 & FW15	FW17
2502	150n	100n
2503	150n	100n
2504	68n	1n
2505	68n	1n
2508	470n	330n
2509	470n	330n
2564	47u	100u
2566	1u	2u2
2567	1u	2u2
3502	22k	100k
3503	22k	100k
3512	3k3	15k
3513	3k3	15k
3544	56k	82k
3545	56k	82k
3546	56k	82k

Item No.	FW14 & FW15	FW17
3547	56k	82k
3554	220k	68k
3555	22k	6k8
3576	10k	22k
3577	10k	22k
3600	10k	22k
3601	10k	22k
3602	6k8	15k
3603	6k8	15k
3604	12k	18k
3605	12k	18k
3612	8k2	10k
3613	8k2	10k
3614	2k2	27k
3615	2k2	27k
3616	2k7	1k5
3617	2k7	1k5
3626	2k2	1k
3627	2k2	1k
2544	2u2	1u
2545	2u2	1u
3528	10k	33k
3529	10k	33k
3630	4k7	12k
3631	4k7	12k
3640	150k	82k

△ For FW14 & FW15 Only
* For FW17 Only
▫ Provisions in layout
C Chip (SMD) Component


ER AMP.
DIGITAL SOUND CONTROLLER
VOL. UP/DOWN & MEGA DBB
MUTE
MC14066BCP
7504
7505
NJM4560
7512A
7512B
7513A
7513B
TC9153AP
7515
VCC
DSC0
DSC1
DSC2
MEGA_DBB
DBB
DBB_C
+B
VOL_UP
MUTE
VOL_DOWN
A0
BUZZER
RELAY
Lout
Rout
TO POWER AMP.
STANDBY
+CMOS
-CMOS
+CD
HEADPHONE
KARAOKE (-/26 ONLY)
MIC 1
MIC 2
MIC_L
MIC_R
GND
FOR FW15 PIN 1 TO 4 ONLY
• ONLY FOR FW14
TROL

DSC1	DSC2
L	L
H	L
L	L
H	H
L	H

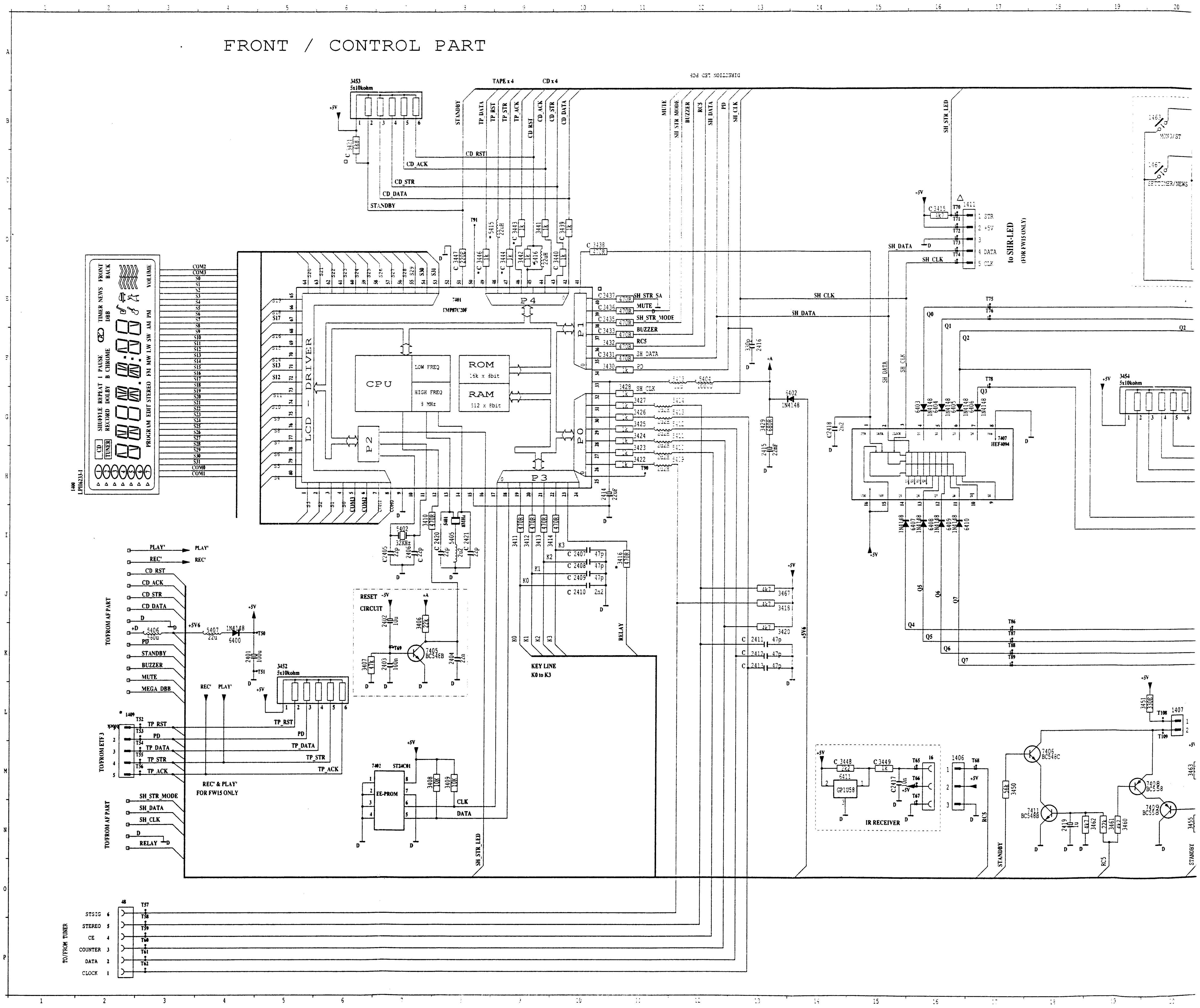
Items marked ' ' : ■

Item No.	FW14 & FW15	FW17
2502	150n	100n
2503	150n	100n
2504	68n	1n
2505	68n	1n
2508	470n	330n
2509	470n	330n
2564	47u	100u
2566	1u	2u2
2567	1u	2u2
3502	22k	100k
3503	22k	100k
3512	3k3	15k
3513	3k3	15k
3544	56k	82k
3545	56k	82k
3546	56k	82k

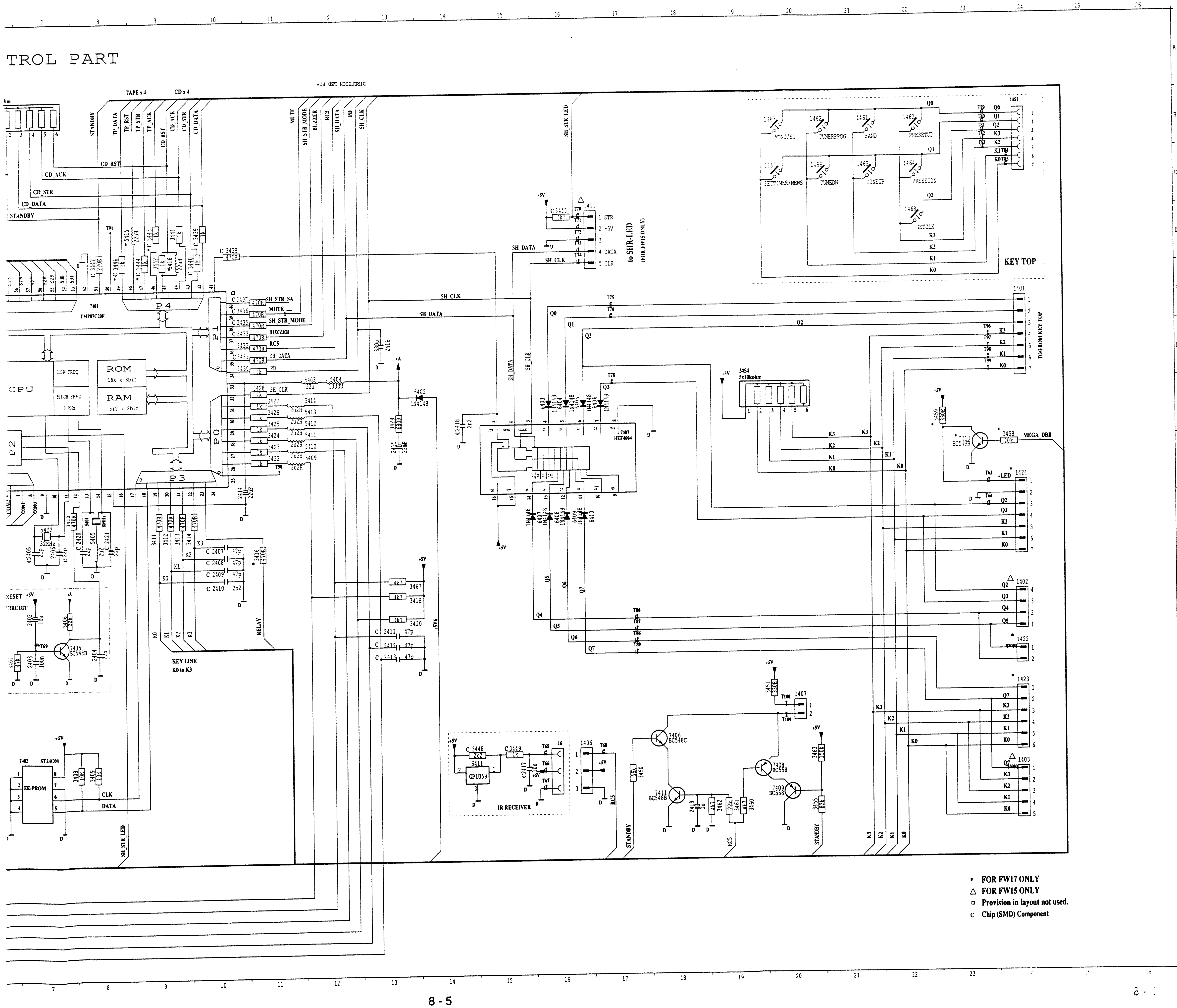
Item No.	FW14 & FW15	FW17
3547	56k	82k
3554	220k	68k
3555	22k	6k8
3576	10k	22k
3577	10k	22k
3600	10k	22k
3601	10k	22k
3602	6k8	15k
3603	6k8	15k
3604	12k	18k
3605	12k	18k
3612	8k2	10k
3613	8k2	10k
3614	2k2	27k
3615	2k2	27k
3616	2k7	1k5
3617	2k7	1k5
3626	2k2	1k
3627	2k2	1k
2544	2u2	1u
2545	2u2	1u
3528	10k	33k
3529	10k	33k
3630	4k7	12k
3631	4k7	12k
3640	150k	82k

△ For FW14 & FW15 Only
* For FW17 Only
◻ Provisions in layout
c Chip (SMD) Component

COMBI CIRCUIT II


FRONT / CONTROL PART
CPU
LOW FREQ
HIGH FREQ
8 MHz
ROM
16k x 8bit
RAM
512 x 8bit
LCD - DRIVER
P0
P1
P2
P3
P4
7401
TMP87C20F
1400
LPH6233-1
SHUFFLE REPEAT 1 PAUSE
RECORD DOLBY B CHROME
PROGRAM EDIT STEREO FM MW LW SW AM PM
TIMER NEWS DBB
FRONT BACK
VOLUME
CD
TUNER
3453
5x10kohm
3452
5x10kohm
3454
5x10kohm
STANDBY
TP DATA
TP RST
TP STR
TP ACK
CD RST
CD ACK
CD STR
CD DATA
TAPE x 4
CD x 4
MUTE
SH STR MODE
BUZZER
RC5
SH DATA
PD
SH CLK
SH STR LED
DIRECTION LED PCB
to SHIR-LED
(FOR FW15 ONLY)
1421
1 STR
2 +5V
3
4 DATA
5 CLK
7407
HEF4094
1N4148
7402
ST24C01
EE-PROM
CLK
DATA
RESET CIRCUIT
7405
BC548B
KEY LINE
K0 to K3
RELAY
TO/FROM AF PART
PLAY'
REC'
CD_RST
CD_ACK
CD_STR
CD_DATA
STANDBY
BUZZER
MUTE
MEGA_DBB
REC' & PLAY'
FOR FW15 ONLY
TO/FROM ETF 3
1409
TP_RST
PD
TP_DATA
TP_STR
TP_ACK
SH_STR_MODE
SH_DATA
SH_CLK
RELAY
TO/FROM TUNER
STSIG 6
STEREO 5
CE 4
COUNTER 3
DATA 2
CLOCK 1
IR RECEIVER
GP1U58
1406
1407
7406
BC548C
7408
BC558
7409
BC558
7411
BC548B
+5V
+5V6
1N4148
6400
32KHz
8MHz

TROL PART



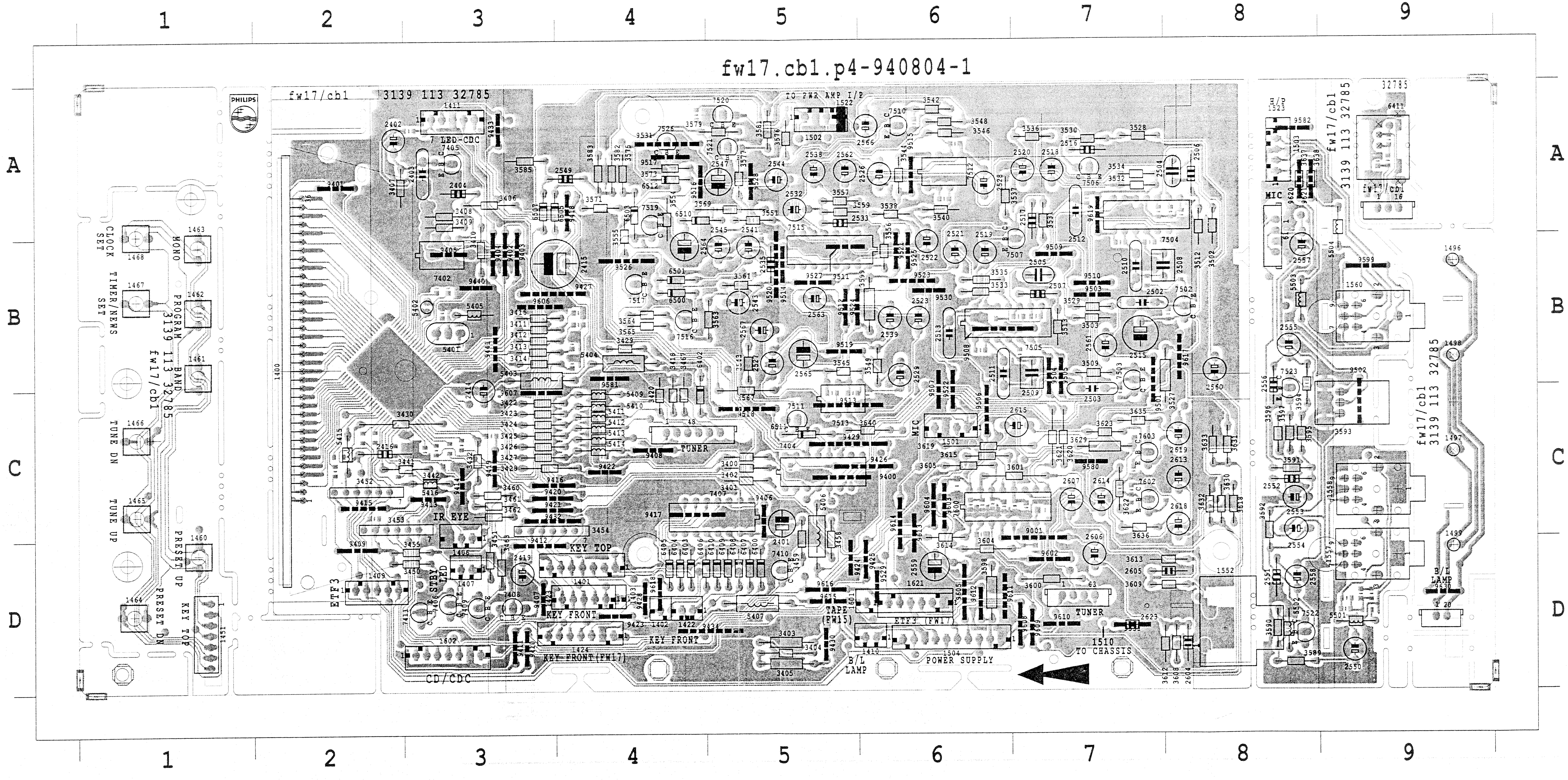
DIRECTION LED PCB
TAPE x 4
CD x 4
STANDBY
TP DATA
TP RST
TP STR
TP ACK
CD RST
CD ACK
CD STR
CD DATA
MUTE
SH STR MODE
BUZZER
RC5
SH DATA
PD
SH CLK
SH STR LED
CD RST
CD ACK
CD STR
CD DATA
STANDBY
7401
TMP87C20F
P4
P1
P0
P2
P3
CPU
LCH FREQ
HIGH FREQ
8 MHz
ROM
16k x 8bit
RAM
512 x 8bit
SH STR SA
MUTE
SH STR MODE
BUZZER
RC5
SH DATA
PD
SH CLK
SH CLK
SH DATA
1411
1 STB
2 +5V
3
4 DATA
5 CLK
to SHR-LED
(FOR FW15 ONLY)
SH DATA
SH CLK
1451
Q0
Q1
Q2
K3
K2
K1
K0
MONO/ST
TUNERPROG
BAND
PRESETUP
SETTIMER/NEWS
TUNEDN
TUNEUP
PRESETDN
SETCLK
KEY TOP
1401
TO/FROM KEY TOP
3454
5x10kohm
7407
HEF4094
MEGA_DBB
BC548B
1424
+LED
1402
1422
1423
1403
5402
32KHz
RESET
CIRCUIT
7405
BC548B
7402
ST24C01
EE-PROM
CLK
DATA
SH_STR_LED
KEY LINE
K0 to K3
RELAY
+5V6
IR RECEIVER
GP1U58
1406
RC5
STANDBY
7406
BC548C
7411
BC548B
7408
BC558
7409
BC558
1407
RC5
STANDBY

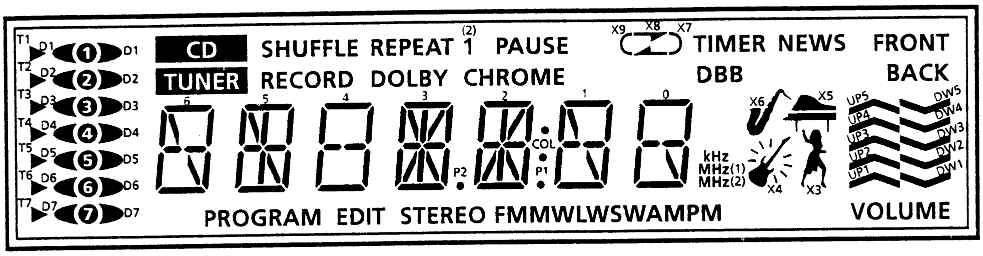
1400	H 1
1401	E24
1402	J24
1403	M24
1406	M16
1407	L20
1409	L 2
1411	C16
1422	K24
1423	L24
1424	H24
1451	B24
1460	B22
1461	B21
1462	B20
1463	B20
1464	C22
1465	C21
1466	C20
1467	C20
1468	D22
16	M16
2401	K 4
2402	J 7
2403	K 7
2404	K 8
2405	[illegible]
2406	I 7
2407	I10
2408	J10
2409	J10
2410	J10
2411	K13
2412	K13
2413	K13
2414	H10
2415	H13
2416	F13
2417	M15
2418	G14
2419	N18
2420	I 8
2421	I 8
3406	K 7
3407	K 6
3408	M 7
3409	M 8
3410	[illegible]
3411	I 9
3412	I 9
3413	I 9
3414	I10
3415	D16
3416	[illegible]
3418	J13
3420	K13
3421	B 6
3422	H11
3423	H11
3424	G11
3425	G11
3426	G11
3427	G11
3428	G11
3429	G13
3430	F10
3431	F10
3432	F10
3433	F10
3435	E10
3436	E10
3437	E10
3438	D10
3439	D10
3440	D10
3441	D 9
3442	D 9
3443	D 9
3444	D 9
3446	D 8
3447	D 8
3448	M14
3449	M15
3450	M17
3451	L20
3452	K 5
3453	A 6
3454	F19
3455	N20
3458	H24
3459	G22
3460	N19
3461	N19
3462	N19
3463	M20
3467	J13
48 0	2
5401	I 8
5402	I 7
5403	F12
5404	F12
5405	I 8
5406	K 3
5407	K 4
5409	H12
5410	H12
5411	G12
5412	G12
5413	G12
5414	G12
5415	D 8
5416	D 9
6400	K 4
6402	G14
6403	G16
6404	G16
6405	G16
6406	G17
6407	I16
6408	I16
6409	I16
6410	I16
6411	M15
7401	E 8
7402	M 6
7405	K 7
7406	M18
7407	G17
7408	M20
7409	N20
7410	H23
7411	N18

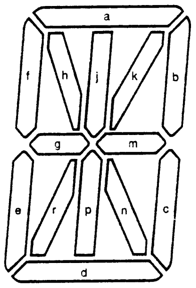
- • FOR FW17 ONLY
- △ FOR FW15 ONLY
- ◻ Provision in layout not used.
- c Chip (SMD) Component

COMBI COMPONENT LAYOUT

1407 D 3	1496 B 9	2401 C 5	2511 B 6	2533 A 5	2557 B 8	2615 C 7	3413 B 3	3450 D 3	3513 B 7	3545 B 5	3573 A 4	3597 C 8	3622 C 7	5406 C 5	6404 D 4	7404 C 5	7513 C 5	9403 B 3	9420 C 3	9502 C 9	9519 B 5	9599 B 9	9618 D 4
1409 D 2	1497 C 9	2402 A 2	2512 A 7	2535 B 5	2558 D 8	2618 C 8	3414 B 3	3451 D 3	3527 B 8	3546 A 6	3575 A 4	3598 D 6	3623 C 7	5407 D 5	6405 D 4	7405 A 3	7515 B 5	9404 B 3	9421 C 3	9503 B 7	9520 B 5	9602 D 7	9619 A 7
1410 D 6	1498 B 9	2403 A 3	2513 B 6	2538 A 5	2559 D 6	2619 C 8	3416 B 3	3452 C 2	3528 A 7	3548 A 6	3576 A 5	3599 B 6	3629 C 7	5409 C 4	6406 D 4	7406 D 3	7516 B 4	9405 B 3	9422 C 4	9504 B 7	9521 B 6	9603 C 6	9620 A 8
1411 A 3	1499 D 9	2404 A 3	2515 B 7	2539 B 6	2560 B 8	2623 D 7	3418 C 4	3453 C 2	3529 B 7	3549 B 6	3577 A 5	3600 D 7	3630 C 8	5410 C 4	6407 D 5	7407 C 5	7517 B 4	9406 C 5	9423 D 4	9505 B 7	9522 C 6	9604 C 6	9621 A 8
1422 D 4	1501 C 6	2414 C 3	2516 A 7	2541 B 5	2561 B 7	3400 C 5	3420 C 4	3454 C 3	3530 A 7	3551 A 5	3579 A 5	3601 C 7	3631 C 8	5411 C 4	6408 D 5	7408 D 3	7519 A 4	9407 D 3	9424 D 5	9506 C 6	9523 B 6	9605 D 6	9630 D 9
1423 D 4	1502 A 5	2415 B 3	2517 A 7	2543 B 5	2562 A 5	3401 C 5	3422 C 3	3455 D 3	3531 A 7	3554 A 4	3581 A 5	3604 D 6	3632 C 8	5412 C 4	6409 D 5	7409 D 3	7520 A 5	9408 C 4	9425 D 6	9507 C 6	9524 B 5	9606 B 3	
1424 D 4	1503 A 8	2416 C 2	2518 A 7	2544 A 5	2563 B 5	3402 C 5	3423 C 3	3458 D 5	3532 A 7	3555 A 4	3582 A 4	3605 C 6	3633 C 8	5413 C 4	6410 D 5	7410 D 5	7521 A 5	9409 D 2	9426 C 6	9508 B 6	9525 B 6	9607 C 3	


1
2
3
4
5
6
7
8
9
A
B
C
D
fw17.cb1.p4-940804-1
fw17/cb1
3139 113 32785
PHILIPS
CLOCK SET
MONO
TIMER/NEWS SET
PROGRAM
BAND
TUNE DN
TUNE UP
PRESET UP
PRESET DN
KEY TOP
LED-CDC
IR EYE
STBY LED
KEY TOP
KEY FRONT
KEY FRONT (FW17)
CD/CDC
ETF3
TUNER
TO PWR AMP I/P
MIC
TAPE (FW15)
B/L LAMP
ETF3 (FW17)
POWER SUPPLY
1510 TO CHASSIS
H/P
32785


T1 D1 1 D1
T2 D2 2 D2
T3 D3 3 D3
T4 D4 4 D4
T5 D5 5 D5
T6 D6 6 D6
T7 D7 7 D7
CD
TUNER
SHUFFLE REPEAT (2) 1 PAUSE
RECORD DOLBY CHROME
X9 X8 X7
TIMER NEWS FRONT
DBB BACK
6 5 4 3 2 1 0
COL
P2
P1
kHz
MHz(1)
MHz(2)
X6 X5 X4 X3
UP5 UP4 UP3 UP2 UP1
DW5 DW4 DW3 DW2 DW1
PROGRAM EDIT STEREO FMMWLWSWAMPM
VOLUME

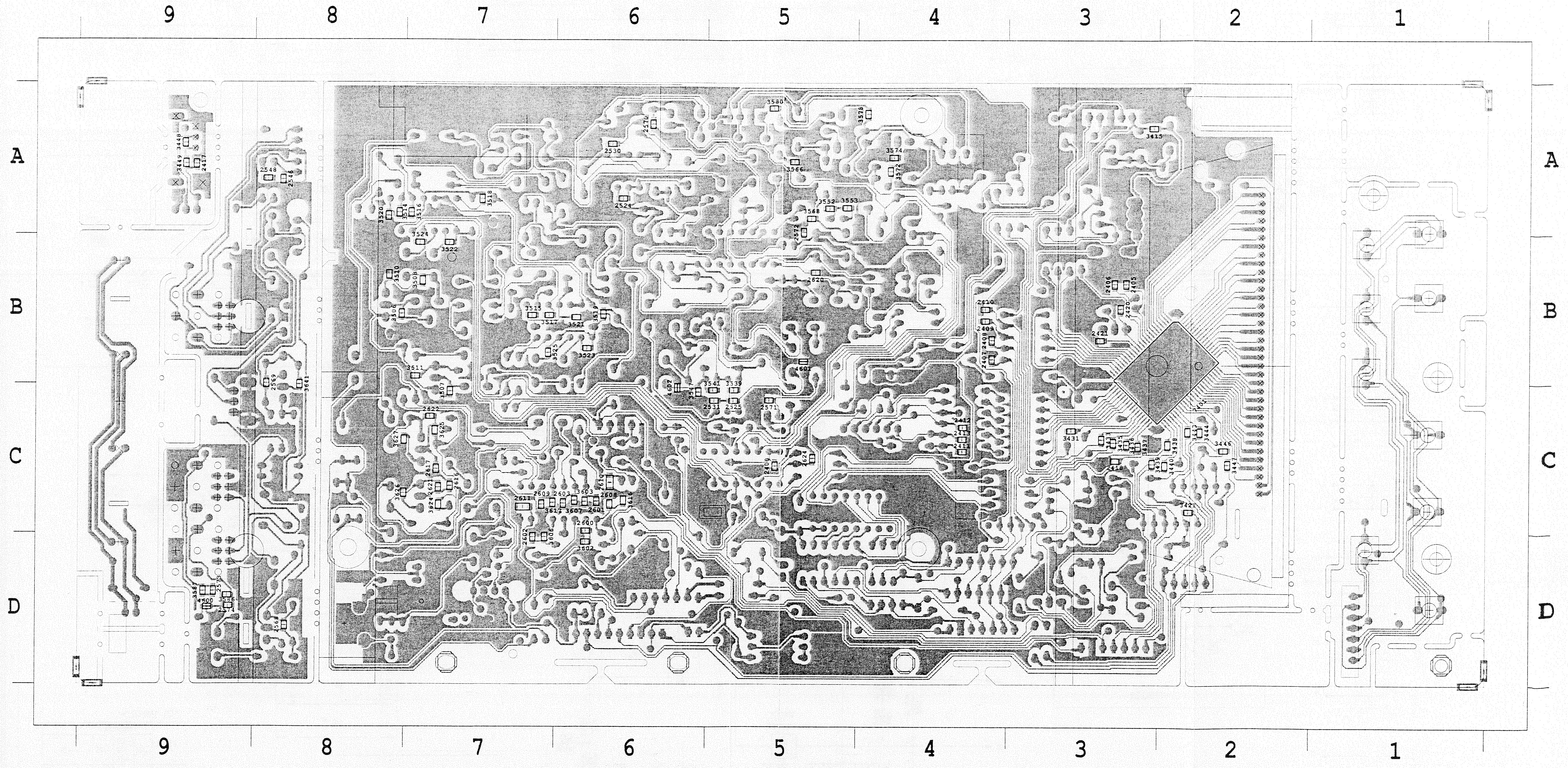

a
f
h
j
k
b
g
m
e
r
p
n
c
d

LCD DISPLAY PINS CONNECTIONS

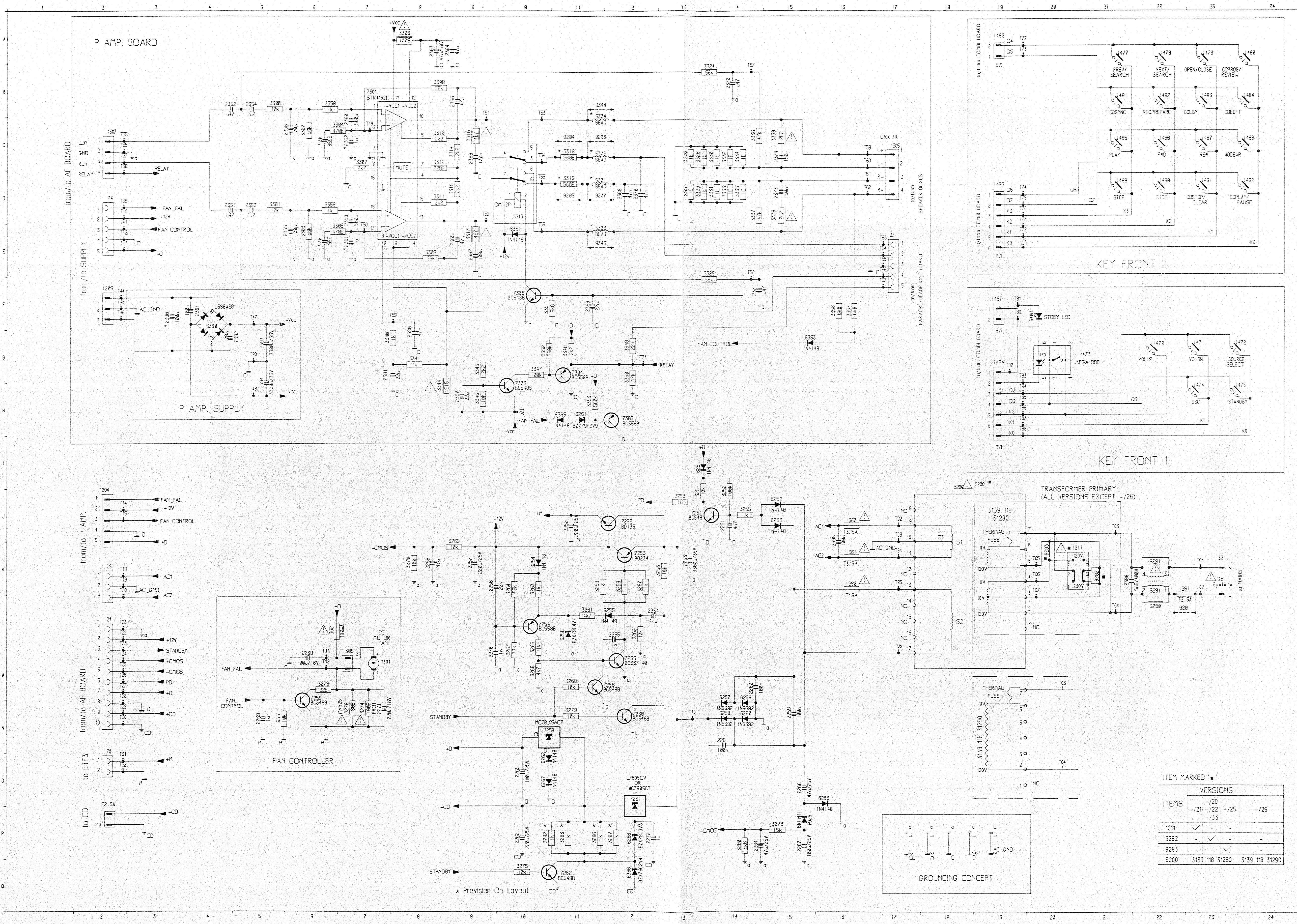
PIN NO.	COM 0	COM 1	COM 2	COM 3
1	-	-	COM 2	-
2	-	-	-	COM 3
3	6gm	6f	6e	6n
4	6b	6a	6c	6d
5	D1	6h	D3	D4
6	SHUFFLE	CD	1,2,3,4,5,6,7	T2
7	5g	5f	5e	PROGRAM
8	5b	5a	5c	5d
9	TUNER	5hn	5m	5jp
10	D5	TIMER	RECORD	REPEAT
11	4gm	4f	4e	EDIT
12	4b	4a	4c	4d
13	X7	X9	X8	1 (2)
14	FRONT	X6	BACK	D6
15	3g	3f	3e	3n
16	3b	3a	3c	3d
17	3k	3h	3m	3jp
18	3r	DBB	PAUSE	STEREO
19	2gm	2f	2e	2n
20	2b	2a	2c	2d
21	2kr	CHROME	DOLBY B	2jp
22	LW	D7	MW	T7
23	1gm	1f	1e	1n
24	1b	1a	1c	1d
25	COL	1h	FM,P1,MHz (1)	SW,P2,MHz (2)
26	X4	kHz	PM	AM
27	0gm	0f	0e	0n
28	0b	0a	0c	0d
29	X3	X5	D2	NEWS
30	UP1	DN1	T1	VOLUME
31	T3	T4	T5	T6
32	-	-	-	-
33	DN2	DN3	DN4	DN5
34	UP1	UP3	UP4	UP5
35	COM 0	-	-	-
36	-	COM 1	-	-

COMBI CHIP LAYOUT

2400 C 5	2409 B 4	2417 A 9	2525 C 5	2568 D 8	2573 D 9	2603 C 6	2616 C 7	2624 C 5	3435 C 3	3440 C 2	3448 A 9	3510 B 8	3517 B 7	3522 B 7	3541 C 5	3568 A 5	3586 D 9	3607 C 6	3626 C 8	4602 C 6
2405 B 3	2410 B 4	2418 C 3	2530 A 6	2569 C 8	2574 D 9	2608 C 6	2617 C 7	3415 A 3	3436 C 3	3443 C 2	3449 A 9	3511 B 7	3518 A 7	3523 B 6	3547 C 6	3572 A 4	3587 D 9	3616 C 6	3627 C 8	7401 B 2
2406 B 3	2411 C 4	2420 B 3	2531 C 5	2570 A 6	2600 C 6	2609 C 7	2620 B 5	3421 C 2	3437 C 3	3444 C 2	3506 B 8	3514 A 8	3519 B 6	3524 B 7	3552 A 5	3574 A 4	3602 D 6	3617 C 7	3641 C 8	
2407 B 4	2412 C 4	2421 B 3	2546 A 8	2571 C 5	2601 C 6	2610 C 6	2621 C 7	3431 C 3	3438 C 2	3446 C 2	3507 C 7	3515 B 7	3520 A 8	3525 B 7	3553 A 5	3578 A 4	3603 C 6	3624 C 7	4600 D 9	
2408 B 4	2413 C 4	2524 A 6	2548 A 8	2572 A 5	2602 D 7	2611 C 7	2622 C 7	3433 C 3	3439 C 3	3447 C 2	3508 B 7	3516 A 7	3521 B 6	3539 C 5	3566 A 5	3580 A 5	3606 D 7	3625 C 7	4601 B 5	



POWER CIRCUIT


P AMP. BOARD
P AMP. SUPPLY
FAN CONTROLLER
KEY FRONT 2
KEY FRONT 1
GROUNDING CONCEPT
TRANSFORMER PRIMARY
(ALL VERSIONS EXCEPT -/26)
3139 118 31290
THERMAL FUSE
from/to AF BOARD
from/to SUPPLY
from/to P AMP.
to ETFS
to CD
to/from SPEAKER BOXES
to/from KARAOKE/HEADPHONE BOARD
to/from COMB BOARD
to MAINS
7301 STK4132II
+VCC1 +VCC2
-VCC1 -VCC2
MUTE
OM1-2P
RELAY
FAN_FAIL
+12V
FAN CONTROL
AC_GND
AC1
AC2
+VCC
-VCC
STANDBY
+CMOS
-CMOS
PD
+CD
DC MOTOR FAN
MC78L05ACP
L7805CV OR MC7805CT
PREV/ SEARCH
NEXT/ SEARCH
OPEN/CLOSE
CDPROG/ REVIEW
CDSYNC
RECPREPARE
DOLBY
CDEDIT
PLAY
REW
MODEAR
STOP
SIDE
CDSTOP/ CLEAR
CDPLAY/ PAUSE
STBY LED
MEGA DBB
VOLUP
VOLDN
SOURCE SELECT
DSC
STANDBY
* Provision On Layout

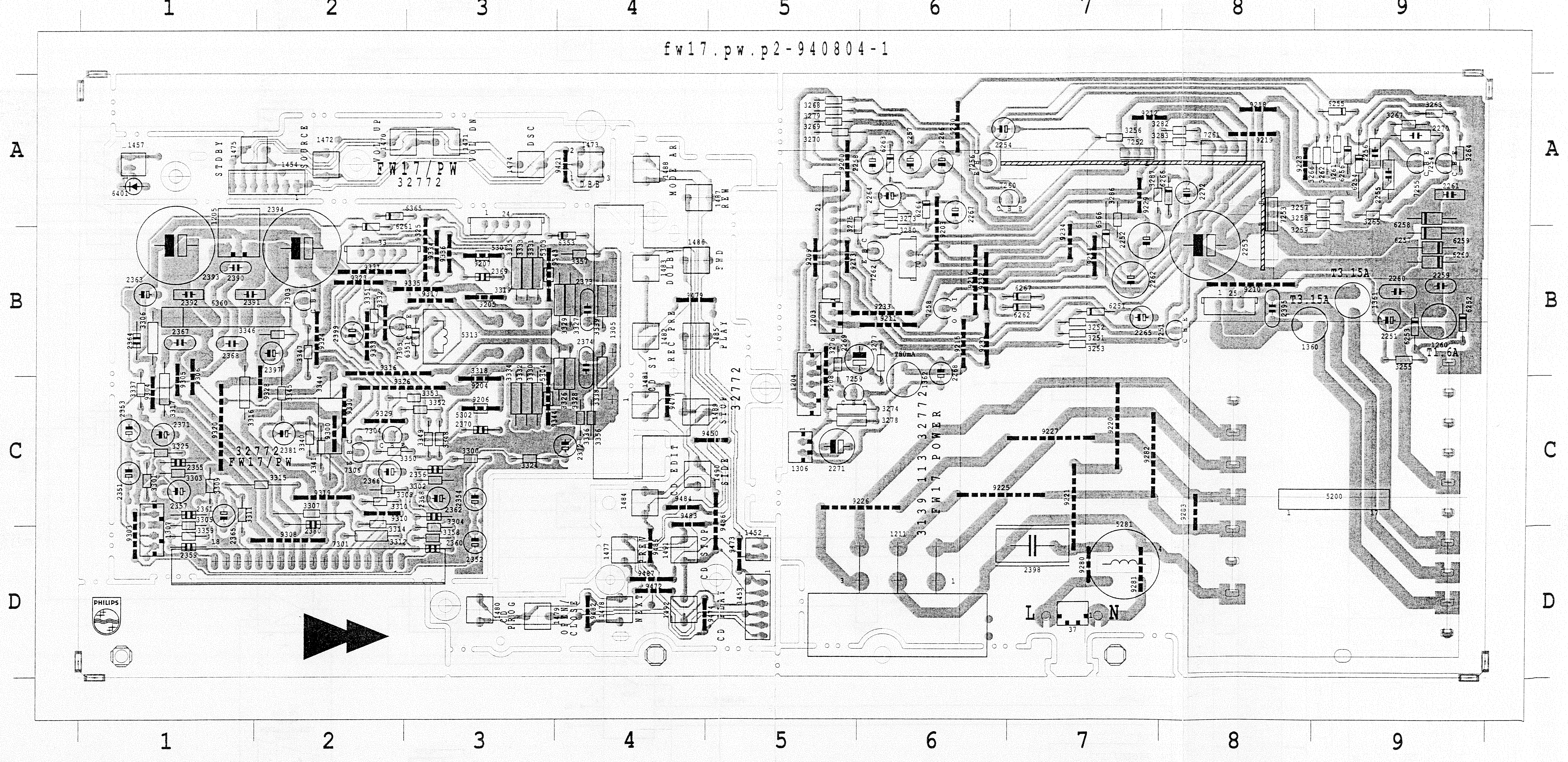
ITEM MARKED '■'

ITEMS	VERSIONS			
	-/21	-/20 -/22 -/33	-/25	-/26
1211	✓	-	-	-
9282	-	✓	-	-
9283	-	-	✓	-
5200	3139 118 31280			3139 118 31290

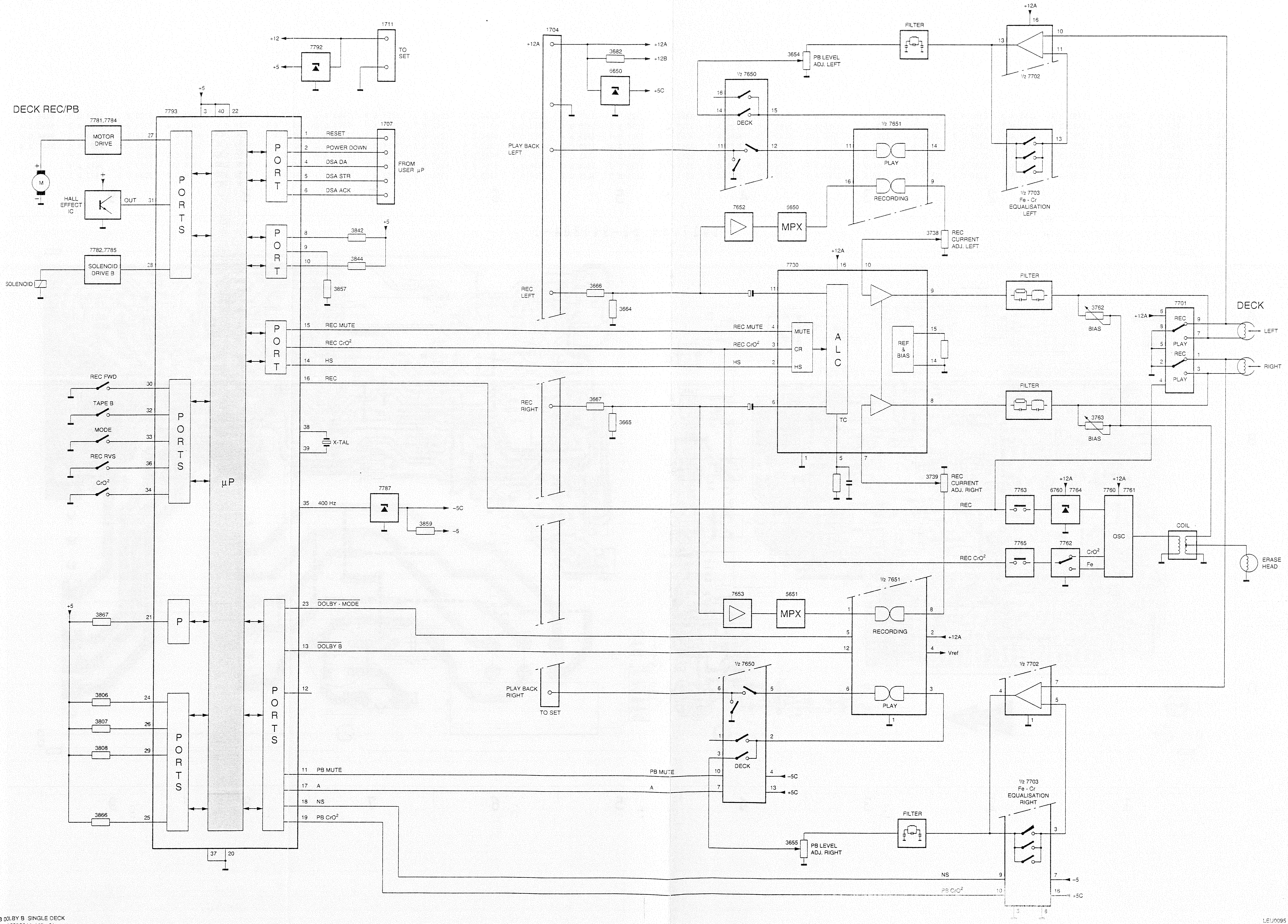
1203	O 2
1204	J 2
1205	F 2
1211	K20
1260	K16
1261	K22
1305	C17
1306	M 7
1307	C 2
1360	J16
1361	K16
1362	L 6
1452	A19
1453	D19
1454	G19
1457	F19
1470	G22
1471	G23
1472	G24
1473	G20
1474	H23
1475	H24
1477	A21
1478	A22
1479	A23
1480	A24
1481	B21
1482	B22
1483	B23
1484	B24
1485	C21
1486	C22
1487	C23
1488	C24
1489	D21
1490	D22
1491	D23
1492	D24
21	L 2
2251	J14
2252	J11
2253	K13
2254	L12
2255	L12
2256	K 9
2257	K 9
2258	K 8
2259	N15
2260	M14
2261	N14
2262	P10
2264	P14
2265	O10
2266	O15
2267	P15
2268	M 6
2269	N 5
2270	M 9
2271	N 7
2272	P12
2351	D 4
2352	B 4
2353	D 5
2354	B 5
2355	E 6
2356	C 6
2357	E 6
2358	C 6
2359	D 7
2360	C 7
2361	E 7
2362	C 7
2363	A 8
2364	A 9
2365	E 9
2366	B 9
2367	E 9
2368	C 9
2369	D12
2370	D12
2371	F14
2372	B14
2373	D15
2374	C15
2380	G 8
2381	G 7
2390	F 3
2391	F 4
2392	G 4
2393	G 5
2394	G 5
2395	J16
2397	H 9
2398	K21
2399	F11
24	D 2
25	K 2
3251	J13
3252	J14
3253	J13
3255	J14
3256	K13
3257	K12
3258	K12
3259	K11
3261	L11
3262	L12
3263	K10
3264	K10
3265	L10
3266	M10
3267	M10
3268	M11
3269	K 9
3270	K 8
3273	P15
3274	N 7
3275	Q10
3276	M 6
3277	N 5
3278	N 7
3279	N11
3280	P14
3282	P10
3283	P11
3286	P11
3287	P12
33	E17
3300	B 5
3301	D 5
3302	C 6
3303	E 6
3304	C 6
3305	E 6
3306	A 8
3307	C 7
3308	B 8
3309	E 8
3310	C 8
3311	D 8
3312	C 8
3314	C 9
3315	D 9
3316	C 9
3317	E 9
3318	C11
3319	D11
3324	B13
3325	E13
3326	C13
3327	D13
3328	C13
3329	D13
3330	C14
3331	D14
3332	C14
3333	D14
3334	C14
3335	D14
3336	C14
3337	D14
3338	C15
3339	D15
3340	G 7
3341	G 8
3344	H 8
3345	G 9
3346	H 9
3347	G10
3348	G11
3349	G12
3350	G12
3351	F10
3352	G10
3353	H11
3356	F16
3357	F16
3358	B 6
3359	D 6
37	K23
5200	I18
5200	I19
5281	K22
5301	D11
5302	C11
5303	E11
5304	C11
5313	D10
6251	I13
6252	J15
6253	J15
6254	K10
6255	L12
6256	L11
6257	M14
6258	N14
6259	M14
6260	N14
6261	H11
6262	O10
6263	O16
6264	P15
6266	P12
6267	O10
6351	E10
6353	G15
6380	F 4
6365	H11
6366	O12
6401	F20
70	N 2
7251	J13
7252	J12
7253	K12
7254	L10
7255	M12
7256	M11
7258	N10
7259	M 6
7260	N12
7261	O12
7262	O11
7301	B 7
7303	H10
7304	G11
7305	F10
7306	H12
9201	L22
9204	C11
9205	D11
9206	C11
9207	D11
9280	L22
9281	K22
9282	K21
9283	K20
9343	E11
9344	B11

POWER LAYOUT

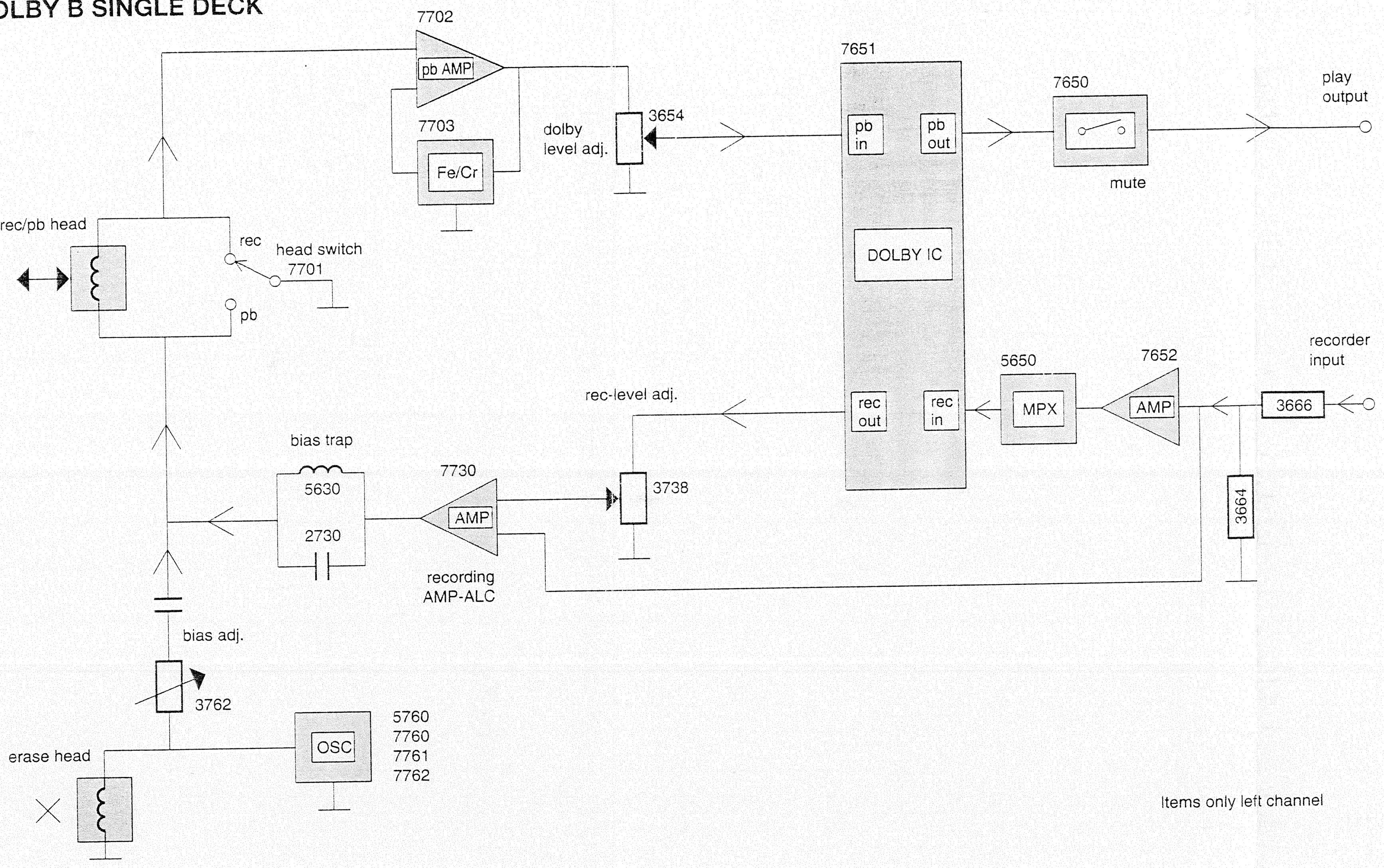
70	B	6
1203	B	5
1204	C	5
1205	B	1
1211	D	6
1260	B	9
1305	B	4
1452	D	5
1453	D	5
1454	A	2
1457	A	1
1470	A	2
1471	A	3
1472	A	2
1479	D	3
1480	D	3
1481	C	4
1482	B	4
1483	B	4
1484	C	4
1485	B	4
1491	D	4
1492	D	4
2251	B	9
2252	B	7
2253	B	8
2254	A	6
2255	A	9
2261	A	9
2262	B	7
2264	A	6
2265	B	7
2266	A	6
2267	A	6
2268	B	6
2352	D	3
2353	C	1
2354	C	3
2355	C	1
2356	C	3
2357	C	1
2358	C	3
2364	B	1
2365	C	1
2366	C	2
2367	B	1
2368	B	1
2369	B	3
2370	C	3
2381	C	2
2390	B	1
2391	B	1
2392	B	1
2393	B	1
2394	B	2
2395	B	8
3253	B	7
3255	B	9
3256	A	7
3257	A	9
3258	A	9
3259	A	9
3261	A	9
3267	A	9
3268	A	5
3269	A	5
3270	A	5
3273	A	6
3274	C	5
3275	B	5
3282	A	8
3283	A	8
3286	A	7
3287	A	7
3300	C	3
3301	C	1
3302	C	3
3308	C	2
3309	C	1
3310	C	2
3311	C	1
3312	D	2
3314	C	2
3315	C	2
3325	C	1
3326	B	4
3327	B	4
3328	B	4
3329	B	4
3330	C	3
3331	B	3
3337	C	1
3338	B	4
3339	B	4
3340	C	2
3341	C	2
3344	B	2
3345	C	2
3351	B	2
3352	C	3
3353	C	3
3356	C	4
3357	B	4
3358	D	3
3359	D	1
5304	C	3
5313	B	3
6251	B	7
6252	B	9
6253	B	9
6254	A	9
6255	A	9
6261	B	2
6262	B	7
6263	A	6
6264	A	6
6266	A	8
6267	B	7
6351	B	3
7251	B	8
7252	A	7
7253	A	8
7254	A	9
7255	A	9
7256	A	6
7258	B	6
7303	B	2
7304	C	2
7305	B	2
7306	C	2
9200	A	5
9203	B	6
9204	C	3
9210	B	8
9211	B	6
9212	A	7
9213	B	5
9214	B	7
9215	B	6
9216	B	6
9225	C	6
9226	C	6
9227	C	7
9229	A	7
9230	A	6
9231	B	6
9232	B	6
9283	C	8
9300	C	2
9303	D	1
9304	C	1
9305	C	1
9306	C	1
9308	D	2
9323	B	2
9324	B	2
9325	B	3
9326	C	2
9328	C	2
9329	C	2
9330	C	2
9336	B	3
9343	B	3
9344	C	3
9421	A	4
9450	C	5
9472	D	4
9473	D	5
9484	C	4
9485	D	4
9486	C	5
9487	D	4


1
2
3
4
5
6
7
8
9
A
B
C
D
fw17.pw.p2-940804-1
STDBY
SOURCE
VOL UP
VOL DN
DSC
FW17/PW
32772
MODE
AR
REW
PHD
DOLBY
REC
PRE
PLAY
CD SY
STOP
EDIT
SIDE
NEXT
PREV
OPEN/CLOSE
PROG
CD PLAY
3139 113 32772
FW17 POWER
T3.15A
T1.6A
280mA
L
N
PHILIPS

BLOCK DIAGRAM DOLBY B SINGLE DECK

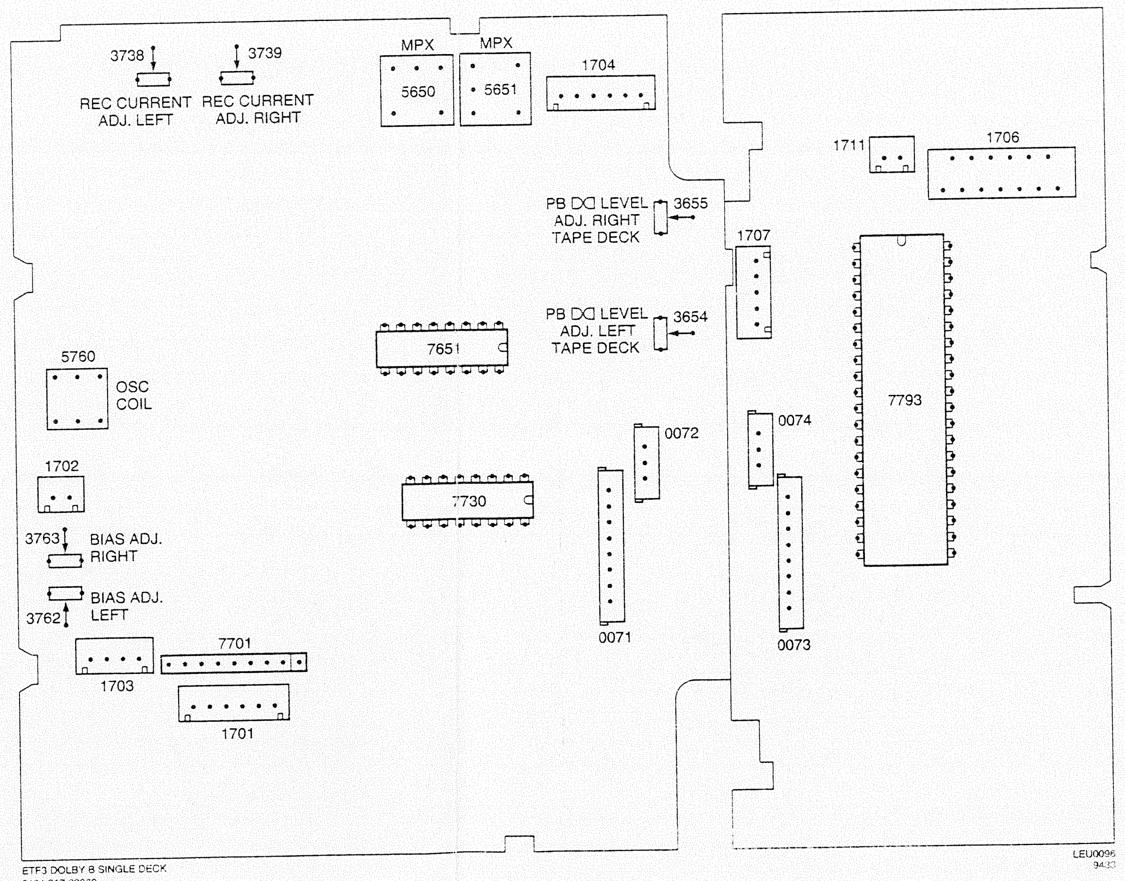

DECK REC/PB
7781,7784
MOTOR DRIVE
M
HALL EFFECT IC
OUT
7782,7785
SOLENOID DRIVE B
SOLENOID
7793
+5
PORTS
PORT
µP
P
RESET
POWER DOWN
DSA DA
DSA STR
DSA ACK
FROM USER µP
1707
1711
TO SET
7792
+12
+5
3842
3844
3857
REC MUTE
REC CrO²
HS
REC
REC FWD
TAPE B
MODE
REC RVS
CrO²
X-TAL
400 Hz
7787
3859
-5C
-5
3867
3806
3807
3808
3866
DOLBY - MODE
DOLBY B
PB MUTE
A
NS
PB CrO²
1704
+12A
3682
+12B
5650
+5C
PLAY BACK LEFT
REC LEFT
3666
3664
REC RIGHT
3667
3665
PLAY BACK RIGHT
TO SET
3654
PB LEVEL ADJ. LEFT
½ 7650
DECK
½ 7651
PLAY
RECORDING
7652
5650
MPX
3738
REC CURRENT ADJ. LEFT
FILTER
½ 7702
½ 7703
Fe - Cr
EQUALISATION LEFT
7730
MUTE
CR
ALC
REF & BIAS
TC
3739
REC CURRENT ADJ. RIGHT
3762
BIAS
3763
7701
DECK
LEFT
RIGHT
7763
6760
7764
7760
7761
OSC
COIL
ERASE HEAD
7765
7762
Fe
REC CrO²
7653
5651
Vref
3655
PB LEVEL ADJ. RIGHT
EQUALISATION RIGHT
-5
+5C

FUNCTIONAL BLOCK DIAGRAM DOLBY B SINGLE DECK


7702
pb AMP
7703
Fe/Cr
dolby
level adj.
3654
7651
pb
in
pb
out
7650
play
output
mute
DOLBY IC
rec/pb head
rec
head switch
7701
pb
5650
7652
recorder
input
rec-level adj.
rec
out
rec
in
MPX
AMP
3666
bias trap
5630
2730
7730
AMP
3738
3664
recording
AMP-ALC
bias adj.
3762
erase head
OSC
5760
7760
7761
7762

Items only left channel

PCB TEST POINTS


3738
REC CURRENT
ADJ. LEFT
3739
REC CURRENT
ADJ. RIGHT
MPX
5650
MPX
5651
1704
1711
1706
PB DD LEVEL
ADJ. RIGHT
TAPE DECK
3655
1707
PB DD LEVEL
ADJ. LEFT
TAPE DECK
3654
7651
7793
5760
OSC
COIL
0072
0074
1702
7730
3763
BIAS ADJ.
RIGHT
BIAS ADJ.
LEFT
3762
0071
0073
7701
1703
1701
ETF3 DOLBY B SINGLE DECK
3104 217 03960
LEU0096
9433

ELECTRICAL MEASUREMENTS

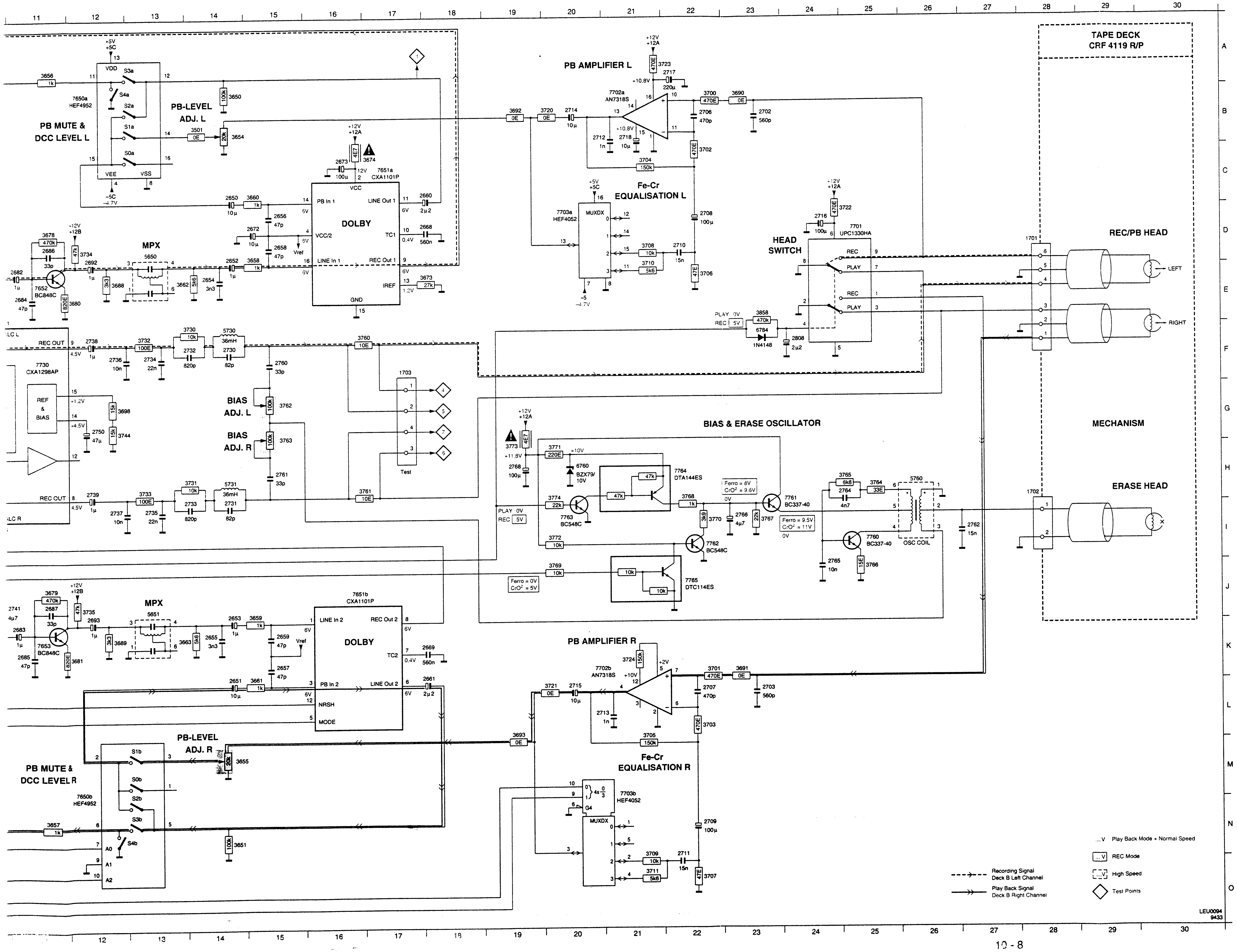
ELECTRICAL MEASUREMENTS AND ADJUSTMENTS SINGLE DECK

Adjustment	Input on or Cassette	Recorder in position	Measure on	Read on	Adjust with	Value	Remarks
Wow and Flutter	SBC419 3150Hz	Play in forward direction	Test point TP 2	Wow and Flutter meter	check	< 0.3%	
Deck Playback DolbyLevel	Dolby 200 N.Wb/m	Play in forward direction	TP 2 left ch TP 3 right ch	AC mV meter	3654 3655	548mV _0,5dB	see #1
Deck Azimuth	SBC 419 12kHz	Play in forward direction	TP 2 left ch or TP 3 right ch	AC mV meter	Left screw Norm.Dir.(>)	max. output left=right	
		Play in reverce direction			Right screw Rev.Dir.(<)		
Bias current Chrome	-	Record mode and Chrome mode	TP 4 5 L.ch	AC mV meter	3762	7 mV	see #2
			TP 6 7 R.ch		3763		
Bias current Ferro	-	Record mode and Ferro mode	TP 4 5 L.ch	AC mV meter	check	4,4mV _0,5dB	
			TP 6 7 R.ch		check		
Recording current *** short circuit C2756 during Rec adjustment**	V input on P 9(Rec L) P10(Rec R) 400Hz/90mV and Chrome.cass (deck)	Record mode and Chrome mode	TP 4 5 L.ch	AC mV meter	3738	0,68mV Rec/PB Level within _1 dB of 548 mV	Filter out osc with audio filter see also #3
			TP 6 7 L.ch		3739		
	V input on P 9(Rec L) P10(Rec R) 400Hz/90mV and Ferro.cass (deck)	Record mode and Ferro mode	TP 4 5 L.ch		check	0,45mV Rec/PB Level within _1 dB of 548 mV	
			TP 6 7 R.ch		check		
Multiplex Filter		Record mode Inject 19kHz at line in	TP 2 left ch. TP 3 right ch	AC mV meter	5650 5651	Min. output Typ. Attenuation >40dB Min. Attenuation >30dB	
Oscillator Frequency		Record mode	TP 4 5 L.ch	Counter	5760	88kHz _6kHz	

#1 Dolby level to be tested in reverse direction within same tolerance.

#2 Bias current must be aligned for Chrome position

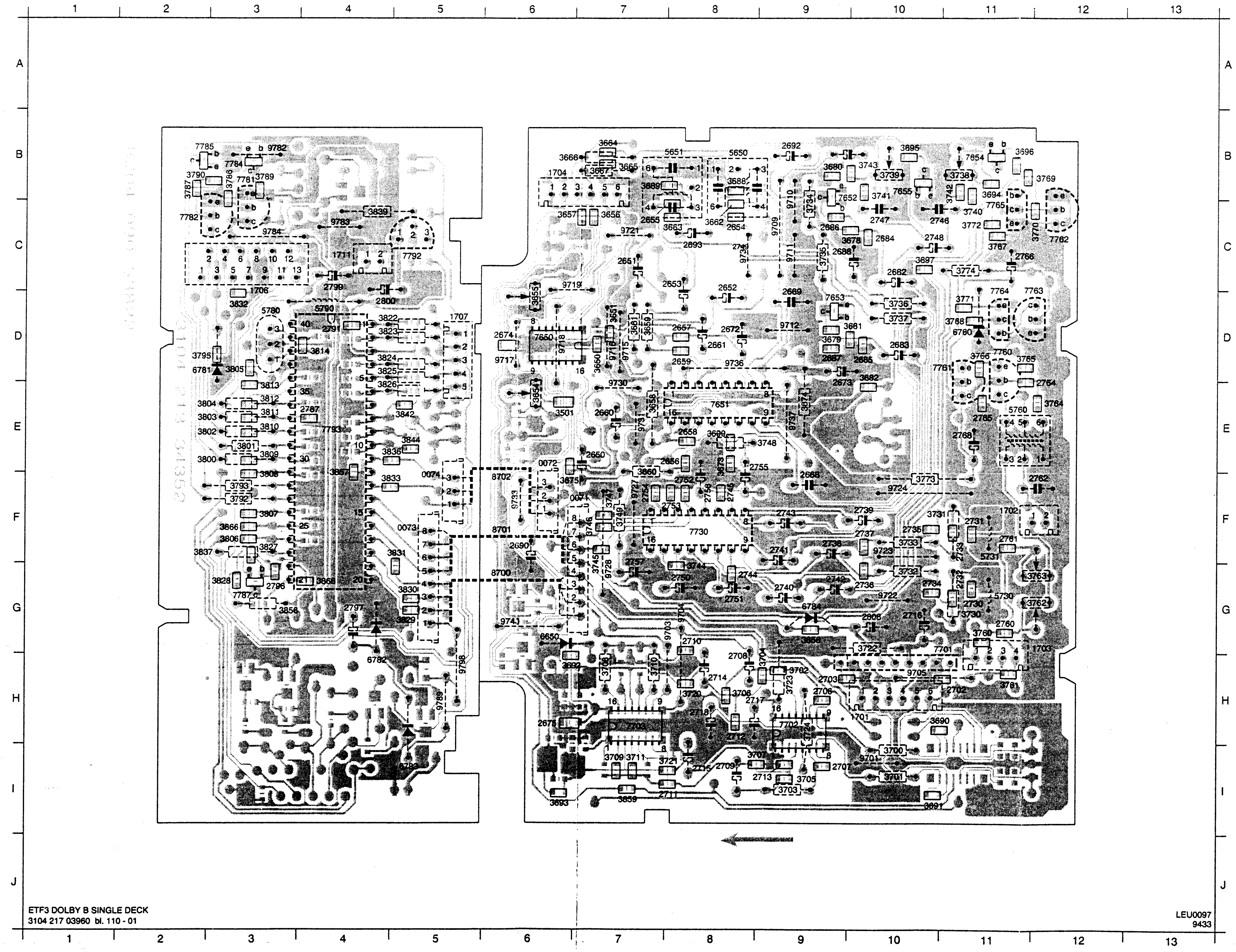
#3 Recording current should be aligned using an iterative method. Perform Ferro tape or Chrome tape as target blank tapes. Then playback the recorded tape. The record/playback level should also be 548 mV _ 0.5 dB. If not, adjust 3738 (L) and 3739 (R) accordingly.


PB MUTE & DCC LEVEL L
7650a HEF4952
PB-LEVEL ADJ. L
DOLBY
7651a CXA1101P
MPX
5650
PB AMPLIFIER L
7702a AN7318S
Fe-Cr EQUALISATION L
7703a HEF4052
MUXDX
HEAD SWITCH
7701 UPC1330HA
TAPE DECK CRF 4119 R/P
REC/PB HEAD
LEFT
RIGHT
MECHANISM
ERASE HEAD
7730 CXA1298AP
REF & BIAS
BIAS ADJ. L
BIAS ADJ. R
1703
Test
BIAS & ERASE OSCILLATOR
7764 DTA144ES
7763 BC548C
7761 BC337-40
7762 BC548C
7760 BC337-40
7765 DTC114ES
5760
OSC COIL
MPX
5651
DOLBY
7651b CXA1101P
PB AMPLIFIER R
7702b AN7318S
PB-LEVEL ADJ. R
PB MUTE & DCC LEVEL R
7650b HEF4952
Fe-Cr EQUALISATION R
7703b HEF4052
Recording Signal Deck B Left Channel
Play Back Signal Deck B Right Channel
...V Play Back Mode + Normal Speed
REC Mode
High Speed
Test Points
LEU0094 9433

0071	E1	3702	C22
0072	L1	3703	L22
1701	D28	3704	C21
1702	H28	3705	L21
1703	F17	3706	E22
1704	A1	3707	O22
2650	C14	3708	D21
2651	K14	3709	N21
2652	D14	3710	D21
2653	J14	3711	O21
2654	E14	3720	B19
2655	K14	3721	L19
2656	D15	3722	D25
2657	K15	3723	A21
2658	D15	3724	K21
2659	K15	3730	F13
2660	C17	3731	H13
2661	K17	3732	F13
2668	D17	3733	H13
2669	K17	3734	D12
2672	D15	3735	J12
2673	C16	3736	B10
2674	E2	3737	K10
2675	D2	3738	F7
2682	E11	3739	I7
2683	K11	3740	F6
2684	E11	3741	H6
2685	K11	3742	E7
2686	D11	3743	H7
2687	J11	3744	G12
2688	C2	3745	F5
2690	L5	3746	G5
2692	D12	3747	G5
2693	J12	3748	H8
2702	B23	3749	E10
2703	L23	3760	F16
2706	B22	3761	H16
2707	L22	3762	G15
2708	D22	3763	G15
2709	N22	3764	H25
2710	D22	3765	H24
2711	N22	3766	J25
2712	B20	3767	I23
2713	L20	3768	H22
2714	B20	3769	J20
2715	L20	3770	I22
2716	D24	3771	H20
2717	A22	3772	I20
2718	B21	3773	H19
2730	F14	3774	H20
2731	H14	3858	E23
2732	F13	3859	E2
2733	H13	5650	D13
2734	F13	5651	J13
2735	I13	5730	F14
2736	F12	5731	H14
2737	I12	5760	H26
2738	F12	6650	D2
2739	H12	6760	H20
2740	E10	6784	F23
2741	J10	7650a	B12
2742	F8	7650b	M12
2743	H8	7651a	C17
2744	F8	7651b	J16
2745	I8	7652	E11
2746	F6	7653	K11
2747	I6	7654	F5
2748	E7	7655	H5
2749	I7	7701	D25
2750	G12	7702a	B21
2751	H9	7702b	K20
2752	G6	7703a	D20
2753	G6	7703b	M21
2754	G6	7730	F11
2755	H8	7760	I25
2756	H8	7761	H24
2757	E9	7762	I22
2760	F15	7763	I20
2761	H15	7764	H22
2762	I27	7765	J22
2764	H24		
2765	J24		
2766	I23		
2768	H19		
2808	F24		
3501	B14		
3650	B14		
3651	N14		
3654	B14		
3655	M14		
3656	A11		
3657	N11		
3658	D15		
3659	J15		
3660	C15		
3661	K15		
3662	E13		
3663	K13		
3664	B10		
3665	K10		
3666	B9		
3667	K9		
3673	E17		
3674	C17		
3675	C2		
3678	D11		
3679	J11		
3680	E12		
3681	K12		
3682	C2		
3688	E12		
3689	K12		
3690	B23		
3691	K23		
3692	B19		
3693	L19		
3694	E6		
3695	H6		
3696	F5		
3697	H5		
3698	G12		
3700	B22		
3701	K22		

ETF3 DOLBY B SINGLE DECK LAYOUT

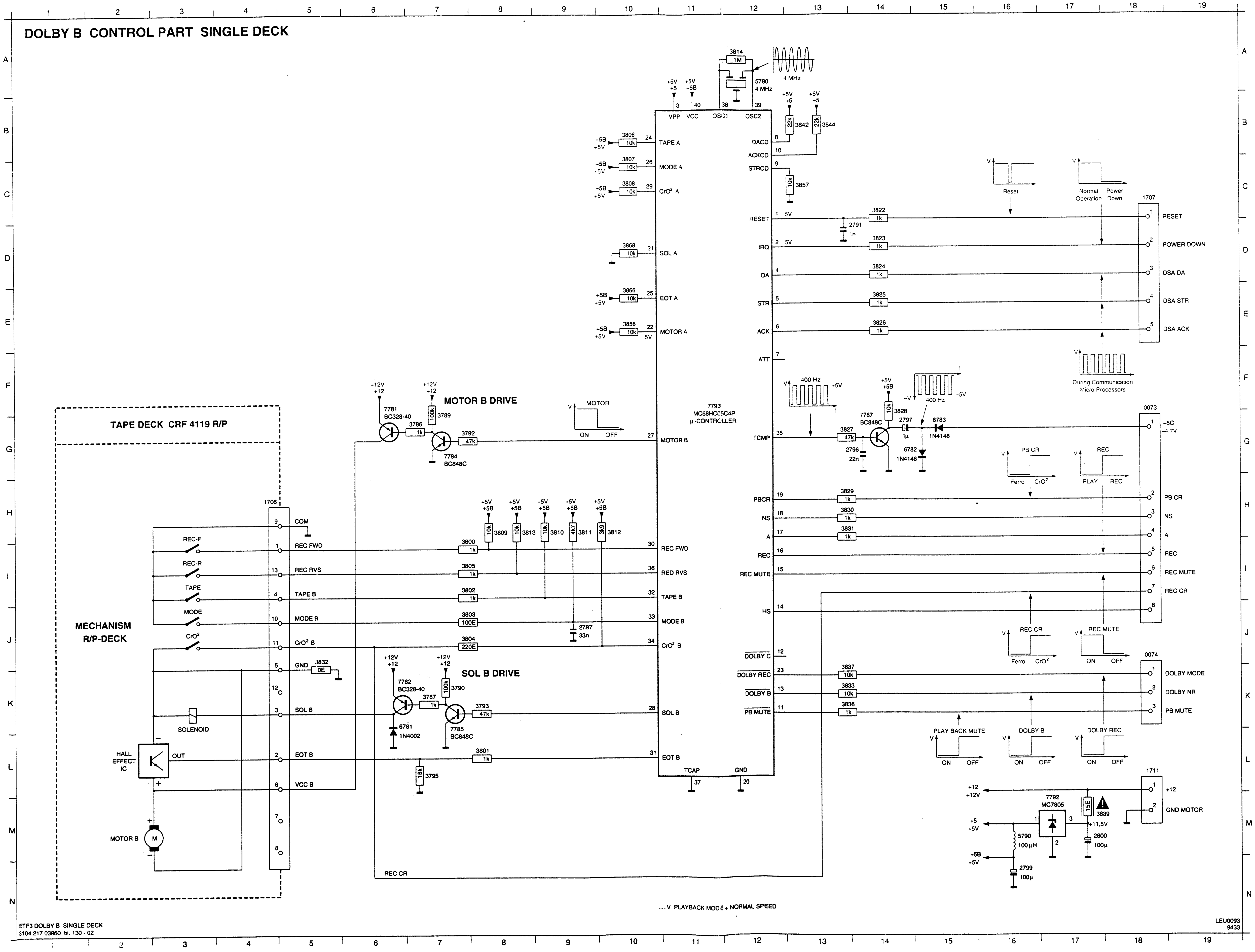
0071	F6	2656	E7	2687	D9	2716	G10	2744	G8	2764	E12	3657	C6	3681	D9	3704	H9	3734	C9	3761	H11	3790	B2	3813	E3	3842	E5	6781	D2	7763	D11	9709	C9	9733	F6
0072	E6	2657	D8	2688	C9	2717	H8	2745	F8	2765	E11	3658	E7	3682	D10	3705	I9	3735	C9	3762	G11	3792	F3	3814	D4	3844	E5	6782	H4	7764	D11	9710	C9	9734	C8
0073	F5	2658	E8	2690	F6	2718	H8	2746	C10	2766	C11	3659	D7	3688	B8	3706	H8	3736	D10	3763	G11	3793	F3	3822	D4	3856	G3	6783	I5	7765	C11	9711	C9	9736	D8
0074	F5	2659	D8	2692	B9	2730	G11	2747	C10	2768	E11	3660	F7	3689	B7	3707	I8	3737	D10	3764	E12	3795	D2	3823	D4	3857	F4	6784	G9	7781	B3	9712	D9	9737	E9
1701	H10	2660	E7	2693	C8	2731	F11	2748	C10	2787	E4	3661	D7	3690	H10	3708	H7	3738	B11	3765	D11	3800	E2	3824	D4	3858	G9	7650	D6	7782	C2	9715	D7	9740	G6
1702	F11	2661	D8	2702	H11	2732	G11	2749	B9	2791	D4	3662	C8	3691	I10	3709	I7	3739	B10	3766	D11	3801	E3	3825	D4	3859	I7	7651	E8	7784	B3	9716	D7	9782	B3
1703	G12	2668	F9	2703	H9	2733	F11	2750	G8	2796	G3	3663	C7	3692	H6	3710	H7	3740	C11	3767	C11	3802	E2	3826	E4	3866	F3	7652	B9	7785	B2	9717	D6	9783	C4
1704	B6	2669	D9	2706	H9	2734	G10	2751	G8	2797	G4	3664	B7	3693	I6	3711	I7	3741	B10	3768	D11	3803	E2	3827	F3	3868	G4	7653	D9	7787	G3	9718	D6	9784	C3
1706	D3	2672	D8	2707	I9	2735	F10	2752	F8	2799	C4	3665	B7	3694	B11	3720	H8	3742	C11	3769	B12	3804	E2	3828	G3	5650	B8	7654	B11	7792	C5	9719	C6	9789	H5
1707	D5	2673	E9	2708	H8	2736	G10	2753	F7	2800	D4	3666	B6	3695	E10	3721	I7	3743	B10	3770	C12	3805	D3	3829	G5	5651	B7	7655	B10	7793	E4	9721	C7	9798	H5
1711	C4	2674	D6	2709	I8	2737	F10	2754	F7	2808	G10	3667	B7	3696	B11	3722	G10	3744	G8	3771	D11	3806	F3	3830	G5	5730	G11	7701	G10	8700	G6	9722	G10		
2650	E7	2675	H6	2710	G8	2738	F9	2755	E8	3501	E6	3673	F8	3697	C10	3723	H9	3745	G7	3772	C11	3807	F3	3831	F4	5731	F11	7702	H9	8701	F6	9723	F10		
2651	C7	2682	C10	2711	I7	2739	F10	2756	F8	3650	D7	3674	E9	3699	E8	3724	H9	3746	F7	3773	F10	3808	F3	3832	D3	5760	E11	7703	H7	8702	F6	9724	F10		
2652	C8	2683	D10	2712	H8	2740	G9	2757	G7	3651	D7	3675	F6	3700	I10	3730	G11	3747	F7	3774	C11	3809	E3	3833	F4	5780	D3	7730	F8	9701	I10	9727	F7		
2653	C7	2684	C10	2713	I8	2741	F9	2760	G11	3654	E6	3678	C9	3701	I10	3731	F10	3748	E9	3786	B3	3810	E3	3836	E4	5790	D4	7760	D11	9703	G8	9728	G7		
2654	C8	2685	D10	2714	H8	2742	G9	2761	F11	3655	D6	3679	D9	3702	H9	3732	G10	3749	F7	3787	B2	3811	E3	3837	F2	6650	G6	7761	D10	9704	G8	9730	E7		
2655	C7	2686	C9	2715	I8	2743	F9	2762	F11	3656	C7	3680	B9	3703	I9	3733	F10	3760	G11	3789	B3	3812	E3	3839	C4	6760	D11	7762	C12	9705	H10	9731	E7		



ETF3 DOLBY B SINGLE DECK
3104 217 03960 bl. 110 - 01

LEU0097
9433

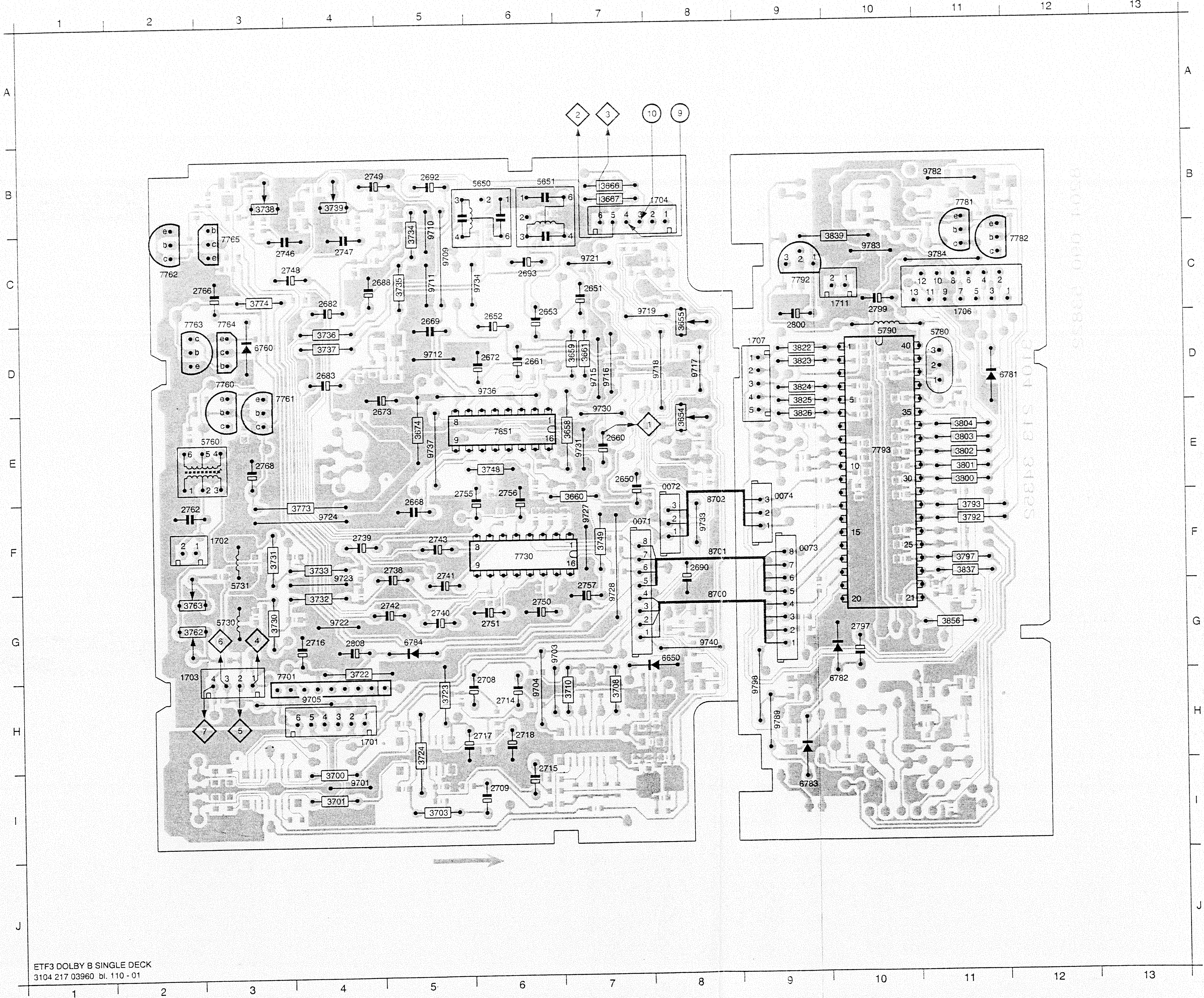
ETF3 DOLBY B SINGLE DECK (CONTROL PART)


DOLBY B CONTROL PART SINGLE DECK
TAPE DECK CRF 4119 R/P
MECHANISM
R/P-DECK
MOTOR B DRIVE
SOL B DRIVE
7793
MC68HC05C4P
µ-CONTROLLER
5780
4 MHz
3814
1M
VPP
VCC
OSC1
OSC2
TAPE A
MODE A
CrO² A
SOL A
EOT A
MOTOR A
MOTOR B
REC FWD
REC RVS
TAPE B
MODE B
CrO² B
SOL B
EOT B
TCAP
GND
DACD
ACKCD
STRCD
RESET
IRQ
DA
STR
ACK
ATT
TCMP
PBCR
NS
A
REC
REC MUTE
HS
DOLBY C
DOLBY REC
DOLBY B
PB MUTE
1707
RESET
POWER DOWN
DSA DA
DSA STR
DSA ACK
0073
-5C
-4.7V
PB CR
NS
A
REC
REC MUTE
REC CR
0074
DOLBY MODE
DOLBY NR
PB MUTE
1711
+12
GND MOTOR
7792
MC7805
3839
15E
+11.5V
2800
100µ
5790
100µH
2799
100µ
+12
+12V
+5
+5V
+5B
+5V
1706
COM
REC FWD
REC RVS
TAPE B
MODE B
CrO² B
GND
SOL B
EOT B
VCC B
REC-F
REC-R
TAPE
MODE
CrO²
SOLENOID
HALL
EFFECT
IC
OUT
MOTOR B
M
3832
0E
7781
BC328-40
7784
BC848C
3786
1k
3789
100k
3792
47k
7782
BC328-40
7785
BC848C
3787
1k
3790
100k
3793
47k
6781
1N4002
3795
18k
3801
1k
3800
1k
3805
1k
3802
1k
3803
100E
3804
220E
2787
33n
3809
3813
3810
3811
3812
10k
4k7
3k9
3806
3807
3808
3868
3866
3856
10k
3842
3844
22k
3857
10k
3822
3823
3824
3825
3826
1k
2791
1n
7787
BC848C
3827
47k
2796
22n
3828
10k
2797
1µ
6782
1N4148
6783
1N4148
400 Hz
3829
3830
3831
1k
3837
3833
3836
10k
1k
REC CR
Reset
Normal Operation
Power Down
During Communication Micro Processors
MOTOR
ON
OFF
PB CR
Ferro
CrO²
REC
PLAY
REC
REC CR
REC MUTE
PLAY BACK MUTE
DOLBY B
DOLBY REC
.....V PLAYBACK MODE + NORMAL SPEED
ETF3 DOLBY B SINGLE DECK
3104 217 03960 bl. 130 - 02
LEU0093
9433

0073	F18
0074	J18
1706	H4
1707	C18
1711	L18
2787	J9
2791	D14
2796	G13
2797	G14
2799	N16
2800	M17
3786	G7
3787	K7
3789	G7
3790	K7
3792	G7
3793	K8
3795	L7
3800	I7
3801	L8
3802	I7
3803	J7
3804	J7
3805	I7
3806	B10
3807	C10
3808	C10
3809	H8
3810	H9
3811	H9
3812	H10
3813	H8
3814	A12
3822	C14
3823	D14
3824	D14
3825	E14
3826	E14
3827	G13
3828	G14
3829	H13
3830	H13
3831	H13
3832	J5
3833	K13
3836	K13
3837	K13
3839	M17
3842	B13
3844	B13
3856	E10
3857	C13
3866	E10
3868	D10
5780	A12
5790	M16
6781	K6
6782	G14
6783	G15
7781	F6
7782	K6
7784	G7
7785	L7
7787	G14
7792	M17
7793	F11

ETF3 DOLBY B SINGLE DECK COMPONENT AND CHIP LAYOUTS

0071	F7	1711	C10	2673	E4	2715	I6	2746	C3	2766	C2	3660	F7	3722	G4	3737	D4	3793	F11	3825	D9	5780	D11	7730	F6	7793	E10	9711	C5	9724	F4	9782	B11
0072	E8	2650	E7	2682	C4	2716	G4	2747	C4	2768	E3	3661	D7	3723	H5	3738	B3	3797	F11	3826	E9	5790	D10	7760	D3	8700	G8	9712	D5	9727	F7	9783	C10
0073	F9	2651	C7	2683	D4	2717	H6	2748	C3	2797	G10	3666	B7	3724	H5	3739	B4	3800	E11	3837	F11	6650	G8	7761	D3	8701	F8	9715	D7	9728	G7	9784	C11
0074	F9	2652	C6	2688	C4	2718	H6	2749	B4	2799	C10	3667	B7	3730	G3	3748	E6	3801	E11	3839	C10	6760	D3	7762	C2	8702	F8	9716	D7	9730	E7	9789	H9
1701	H4	2653	C6	2690	F8	2738	F5	2750	G6	2800	D9	3674	E5	3731	F3	3749	F7	3802	E11	3856	G11	6781	D11	7763	D2	9701	I4	9717	D8	9731	E7	9798	H9
1702	F3	2660	E7	2692	B5	2739	F4	2751	G6	2808	G4	3700	I4	3732	G4	3762	G2	3803	E11	5650	B6	6782	H9	7764	D3	9703	G6	9718	D8	9733	F8		
1703	G2	2661	D6	2693	C6	2740	G5	2755	E5	3654	E8	3701	I4	3733	F4	3763	G2	3804	E11	5651	B6	6783	I9	7765	C3	9704	H6	9719	C7	9734	C6		
1704	B8	2668	F5	2708	H6	2741	F5	2756	E6	3655	D8	3703	I5	3734	C5	3773	F4	3822	D9	5730	G3	6784	G5	7781	B11	9705	H4	9721	C7	9736	D6		
1706	D11	2669	D5	2709	I6	2742	G4	2757	G7	3658	E7	3708	H7	3735	C5	3774	C3	3823	D9	5731	F3	7651	E6	7782	C12	9709	C5	9722	G4	9737	E5		
1707	D9	2672	D6	2714	H6	2743	F5	2762	F2	3659	D7	3710	H7	3736	D4	3792	F11	3824	D9	5760	E3	7701	G3	7792	C9	9710	C5	9723	F4	9740	G8		



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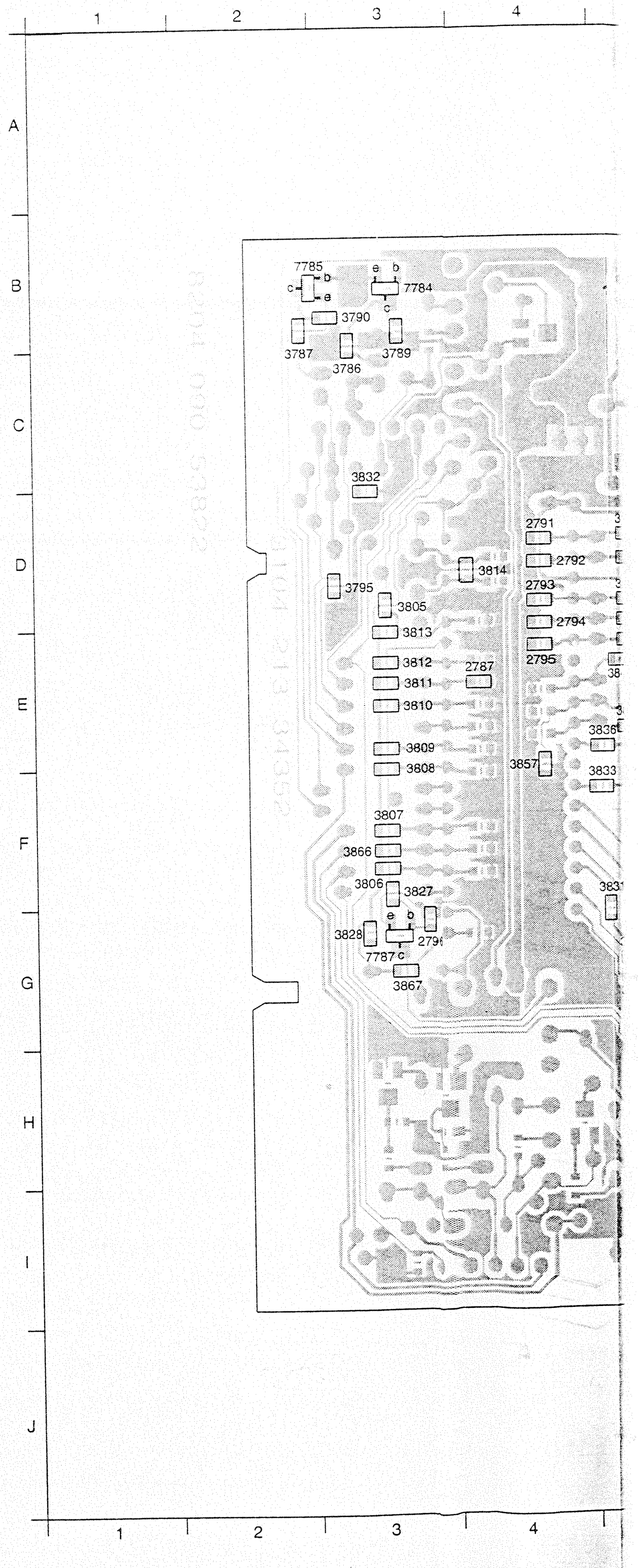
ETF3 DOLBY B SINGLE DECK
3104 217 03960 bl. 110 - 01

2654	C8	2684	C10	2710	G8	2734	G10	2754	F7	2793	D4
2655	C8	2685	D10	2711	I8	2735	F10	2760	G11	2794	E4
2656	E8	2686	C9	2712	H8	2736	G10	2761	F11	2795	E4
2657	D8	2687	D9	2713	I9	2737	F10	2764	E12	2796	G3
2658	E8	2702	H10	2730	G11	2744	G8	2765	E11	3501	E6
2659	D8	2703	H9	2731	F11	2745	F8	2787	E4	3650	D7
2674	D6	2706	H9	2732	G11	2752	F8	2791	D4	3651	D7
2675	H6	2707	I9	2733	F11	2753	F8	2792	D4	3656	C7



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5780	D11	7730	F6	7793	E10	9711	C5	9724	F4	9782	B11		
5790	D10	7760	D3	8700	G8	9712	D5	9727	F7	9783	C10		
6650	G8	7761	D3	8701	F8	9715	D7	9728	G7	9784	C11		
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6781	D11	7763	D2	9701	I4	9717	D8	9731	E7	9798	H9		
6782	H9	7764	D3	9703	G6	9718	D8	9733	F8				
6783	I9	7765	C3	9704	H6	9719	C7	9734	C6				
6784	G5	7781	B11	9705	H4	9721	C7	9736	D6				
7651	E6	7782	C12	9709	C5	9722	G4	9737	E5				
7701	G3	7792	C9	9710	C5	9723	F4	9740	G8				

2654	C8	2684	C10	2710	G8	2734	G10	2754	F7	2793	D4	3657	C6	3679	D9	3692	G6
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2675	H6	2707	I9	2733	F11	2753	F8	2792	D4	3656	C7	3678	C9	3691	I10	3702	H9

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3705	I9	3741	B10	3761	H11	3771	D11	3806	F3	3814	D4	3829	G5	3857	F4	7654	B11
3706	H8	3742	B11	3764	E12	3772	C11	3807	F3	3816	D5	3830	G5	3858	G9	7655	B10
3707	I8	3743	B10	3765	D11	3786	C3	3808	F3	3817	D5	3831	F5	3859	I7	7702	H9
3709	I7	3744	G8	3766	D11	3787	C2	3809	E3	3818	D5	3832	C3	3866	F3	7703	H7
3711	I7	3745	F7	3767	C11	3789	C3	3810	E3	3819	D5	3833	F4	3867	G3	7784	B3
3720	H8	3746	F7	3768	D11	3790	B3	3811	E3	3820	E5	3836	E4	7650	D6	7785	B2
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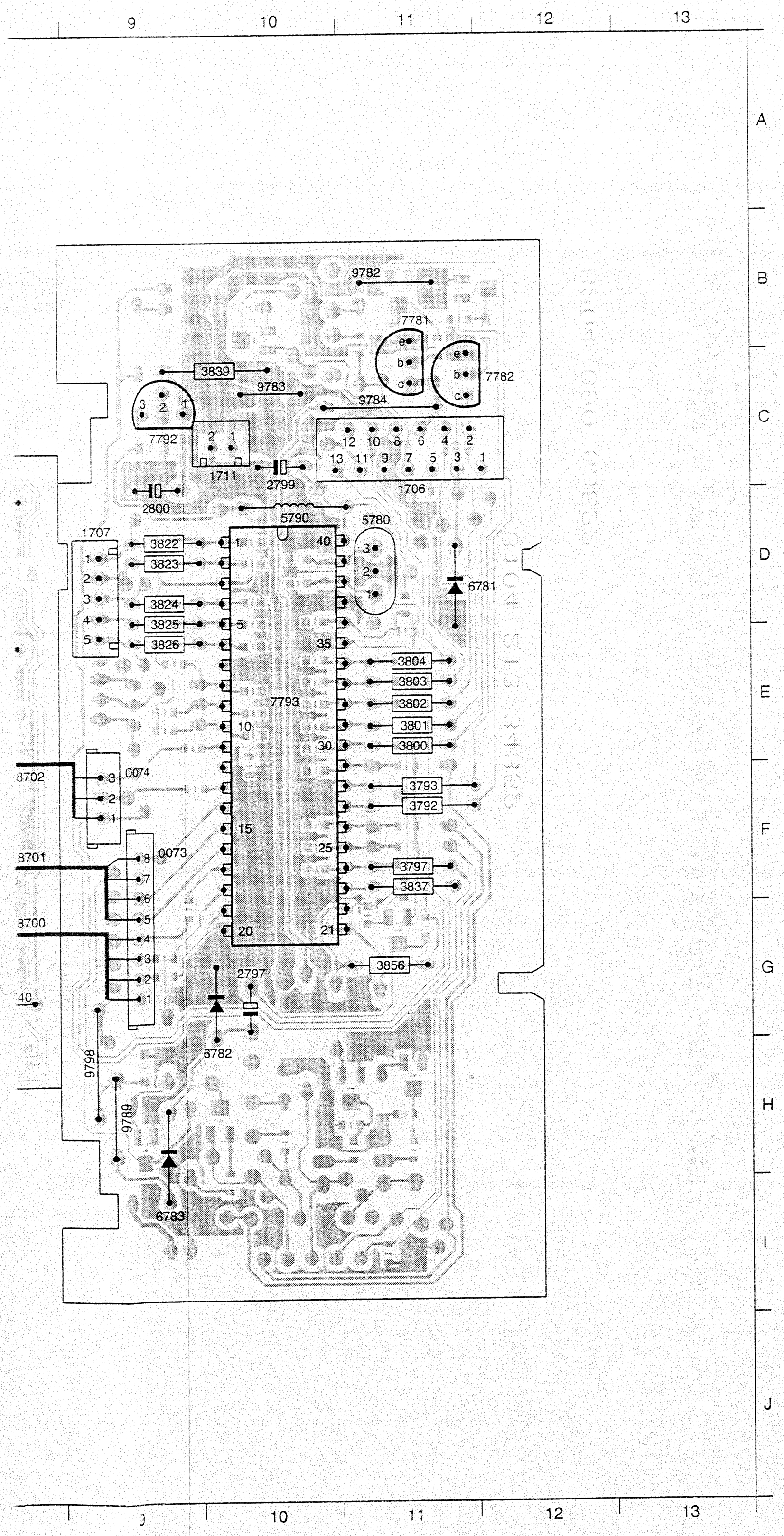
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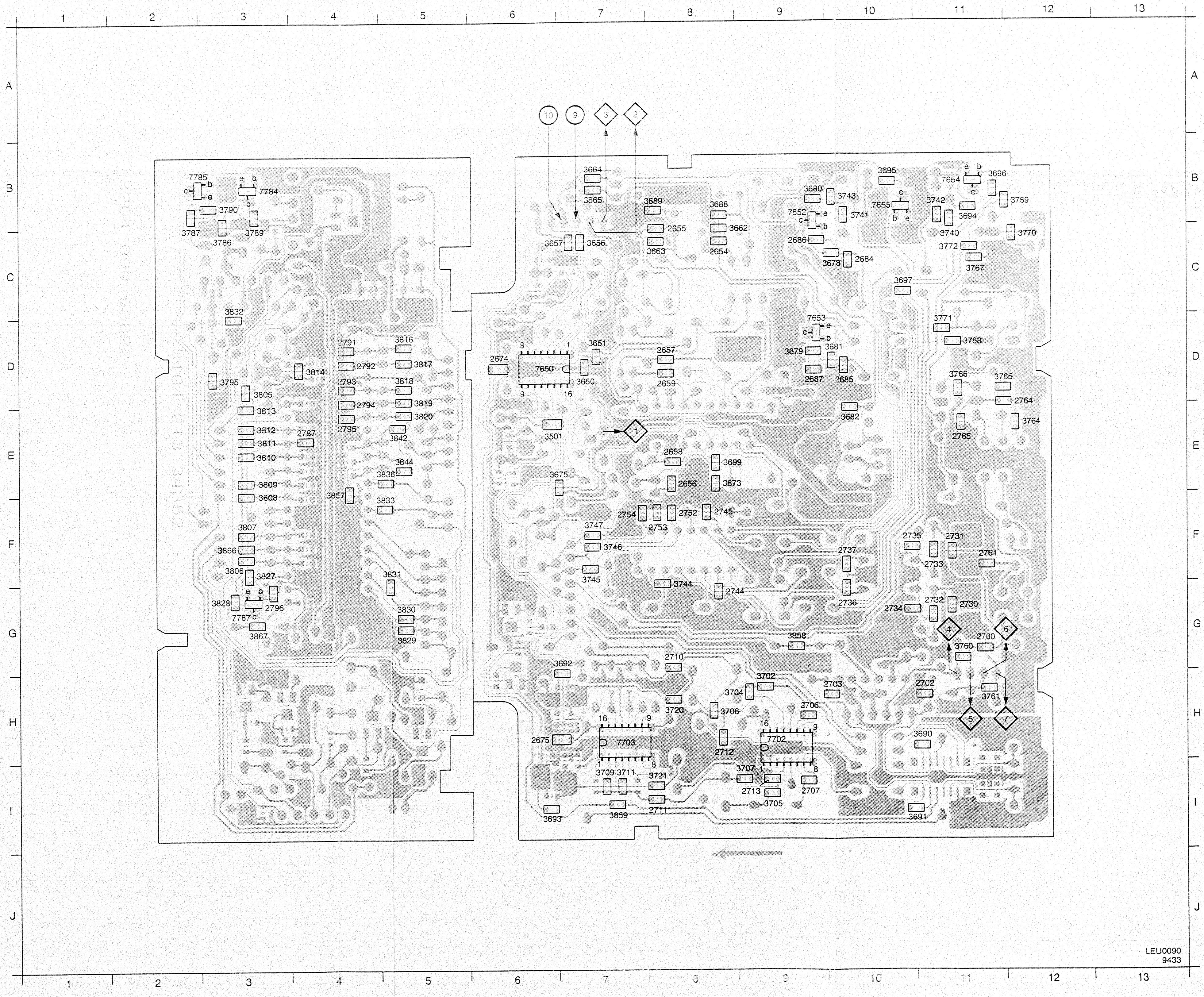
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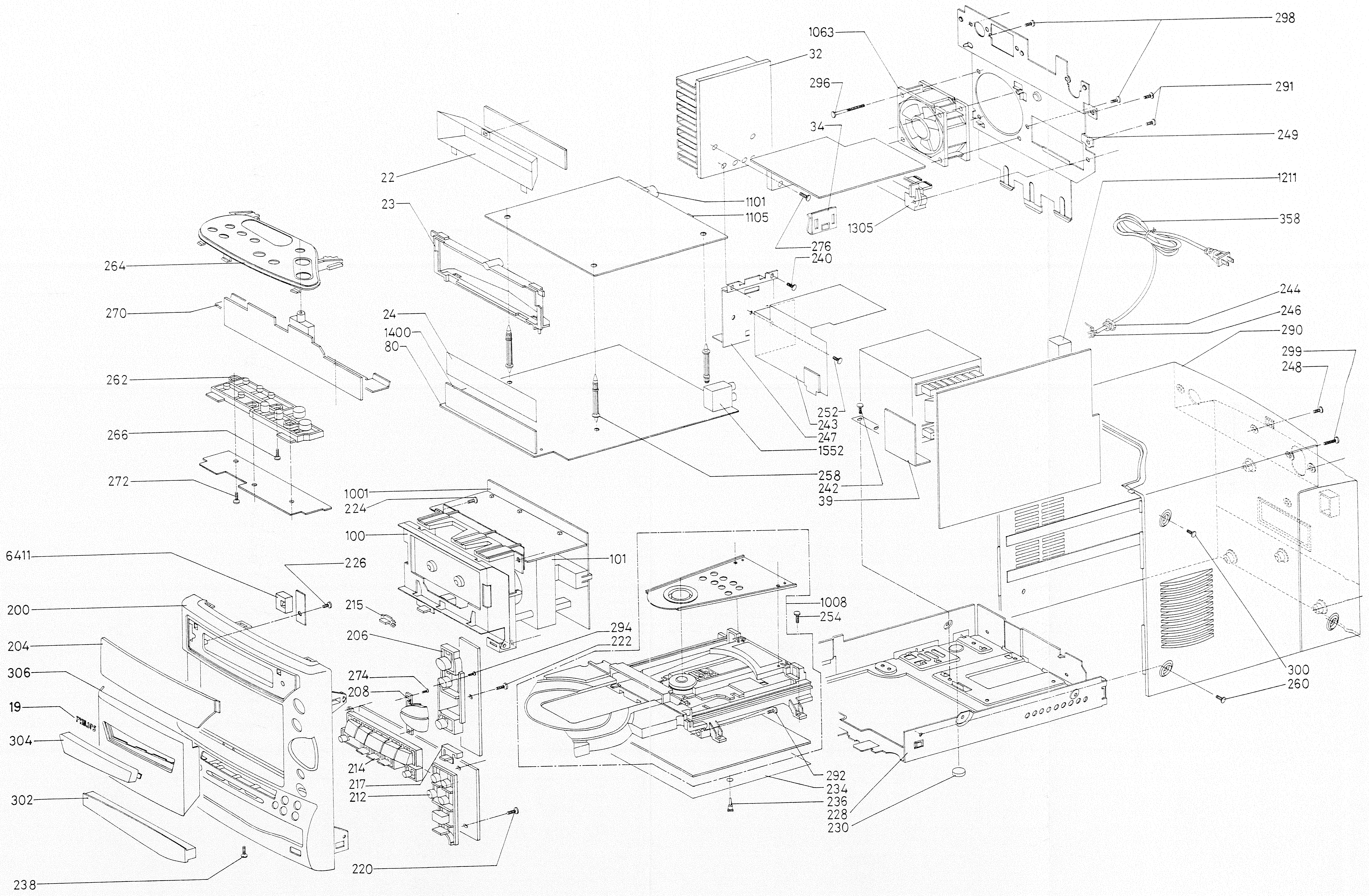
EXPLODED VIEW - CENTER UNIT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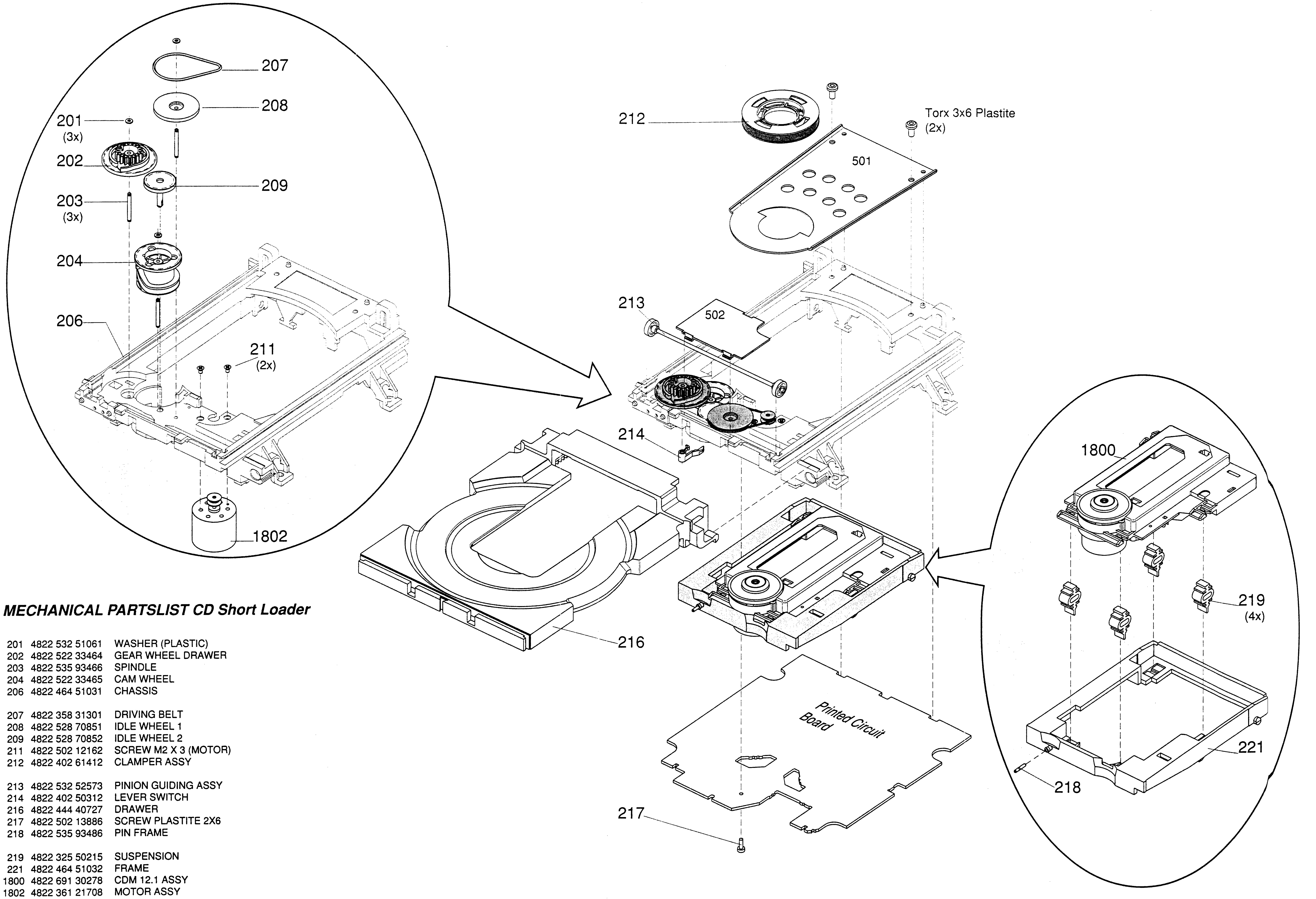
EXPLODED VIEW - CD UNIT

Exploded view CD Short Loader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201
(3x)
202
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203
(3x)
204
206
211
(2x)
1802
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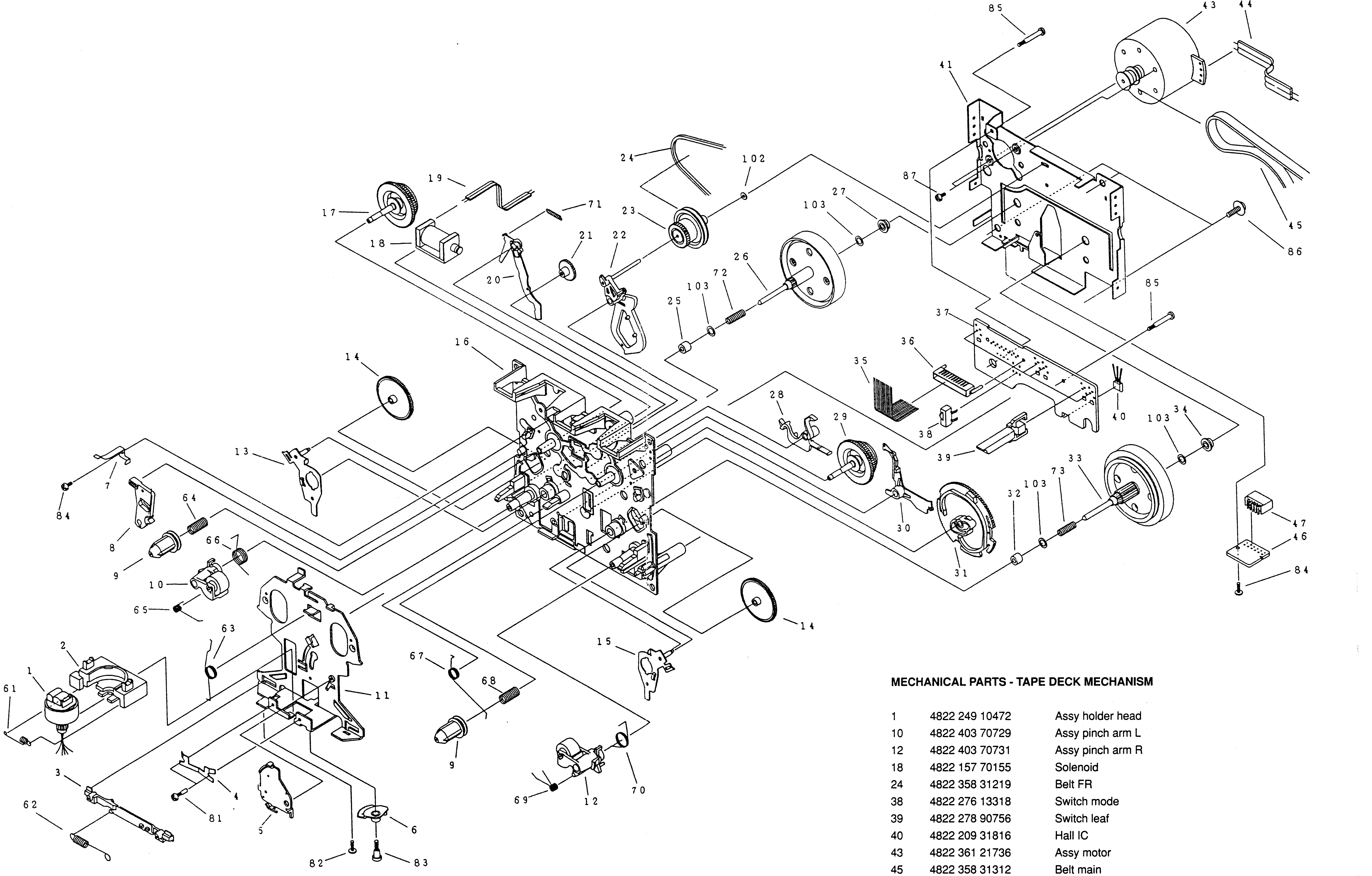
Torx 3x6 Plastite
(2x)
501
213
502
214
216
1800
219
(4x)
221
218
Printed Circuit Board
217

MECHANICAL PARTSLIST CD Short Loader

201	4822 532 51061	WASHER (PLASTIC)
202	4822 522 33464	GEAR WHEEL DRAWER
203	4822 535 93466	SPINDLE
204	4822 522 33465	CAM WHEEL
206	4822 464 51031	CHASSIS
207	4822 358 31301	DRIVING BELT
208	4822 528 70851	IDLE WHEEL 1
209	4822 528 70852	IDLE WHEEL 2
211	4822 502 12162	SCREW M2 X 3 (MOTOR)
212	4822 402 61412	CLAMPER ASSY
213	4822 532 52573	PINION GUIDING ASSY
214	4822 402 50312	LEVER SWITCH
216	4822 444 40727	DRAWER
217	4822 502 13886	SCREW PLASTITE 2X6
218	4822 535 93486	PIN FRAME
219	4822 325 50215	SUSPENSION
221	4822 464 51032	FRAME
1800	4822 691 30278	CDM 12.1 ASSY
1802	4822 361 21708	MOTOR ASSY
	4822 502 30735	SCREW 3 X 6 PLASTITE

EXPLODED VIEW - TAPE DECK MECHANISM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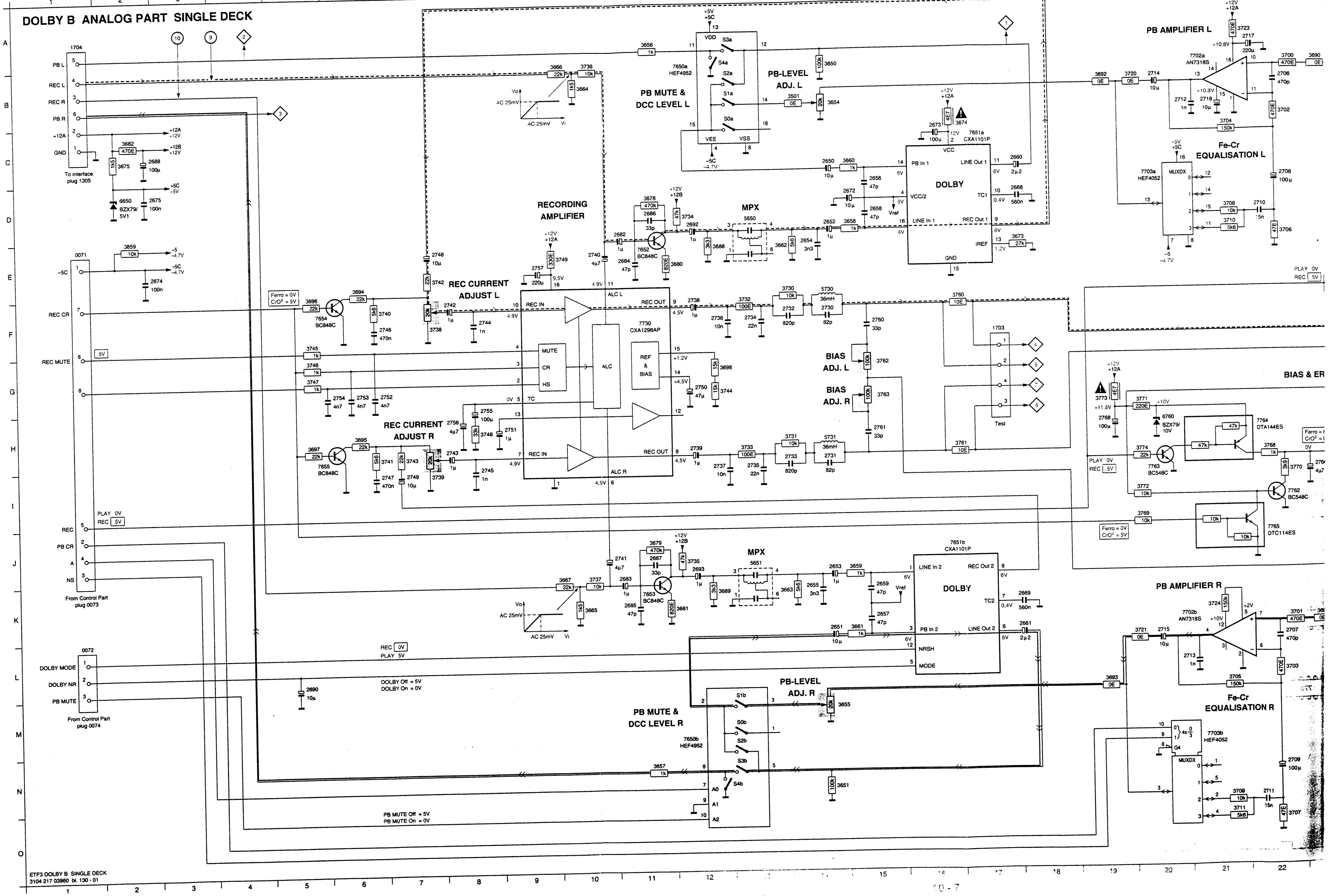
MECHANICAL PARTS - TAPE DECK MECHANISM

1	4822 249 10472	Assy holder head
10	4822 403 70729	Assy pinch arm L
12	4822 403 70731	Assy pinch arm R
18	4822 157 70155	Solenoid
24	4822 358 31219	Belt FR
38	4822 276 13318	Switch mode
39	4822 278 90756	Switch leaf
40	4822 209 31816	Hall IC
43	4822 361 21736	Assy motor
45	4822 358 31312	Belt main

ETF3 DOLBY B SINGLE DECK (ANALOG PART)


DOLBY B ANALOG PART SINGLE DECK
1704
PB L
REC L
REC R
PB R
+12A
GND
To interface plug 1305
0071
-5C
REC CR
REC MUTE
REC
PB CR
A
NS
From Control Part plug 0073
0072
DOLBY MODE
DOLBY NR
PB MUTE
From Control Part plug 0074
PLAY 0V
REC 5V
REC 0V
PLAY 5V
DOLBY Off = 5V
DOLBY On = 0V
PB MUTE Off = 5V
PB MUTE On = 0V
Ferro = 0V
CrO² = 5V
PB MUTE & DCC LEVEL L
PB MUTE & DCC LEVEL R
7650a HEF4952
7650b HEF4952
PB-LEVEL ADJ. L
PB-LEVEL ADJ. R
RECORDING AMPLIFIER
MPX
5650
5651
7652 BC848C
7653 BC848C
REC CURRENT ADJUST L
REC CURRENT ADJUST R
7654 BC848C
7655 BC848C
7730 CXA1298AP
REC IN
REC OUT
MUTE
CR
HS
TC
ALC
ALC L
ALC R
REF & BIAS
BIAS ADJ. L
BIAS ADJ. R
1703
Test
DOLBY
7651a CXA1101P
7651b CXA1101P
PB In 1
LINE Out 1
VCC/2
LINE In 1
REC Out 1
TC1
IREF
LINE In 2
REC Out 2
TC2
PB In 2
LINE Out 2
NRSH
MODE
VCC
GND
Vref
PB AMPLIFIER L
PB AMPLIFIER R
7702a AN7318S
7702b AN7318S
Fe-Cr EQUALISATION L
Fe-Cr EQUALISATION R
7703a HEF4052
7703b HEF4052
MUXDX
BIAS & ER
7764 DTA144ES
7765 DTC114ES
7763 BC548C
7762 BC548C
6760 BZX79/ 10V
6650 BZX79/ 5V1
AC 25mV
ETF3 DOLBY B SINGLE DECK
3104 217 03960 bl. 130 - 01

SCREW LIST - MAIN UNIT

103	D3 x 12
174	D3 x 6
175	D2 x 8
220	D3 x 10
222	D3 x 10
223	D3 x 10
224	D3 x 12
226	D3 x 10
238	M3 x 6
240	D3 x 10
242	M3 x 6
248	M3 x 10
252	M3 x 6
254	M3 x 6
260	M3 x 6
266	D3 x 8
272	D3 x 10
274	D2 x 8
276	D3 x 16
292	D3 x 12
294	D2 x 8
296	M3 x 30
298	D3 x 12
299	D3 x 12
300	D3 x 10

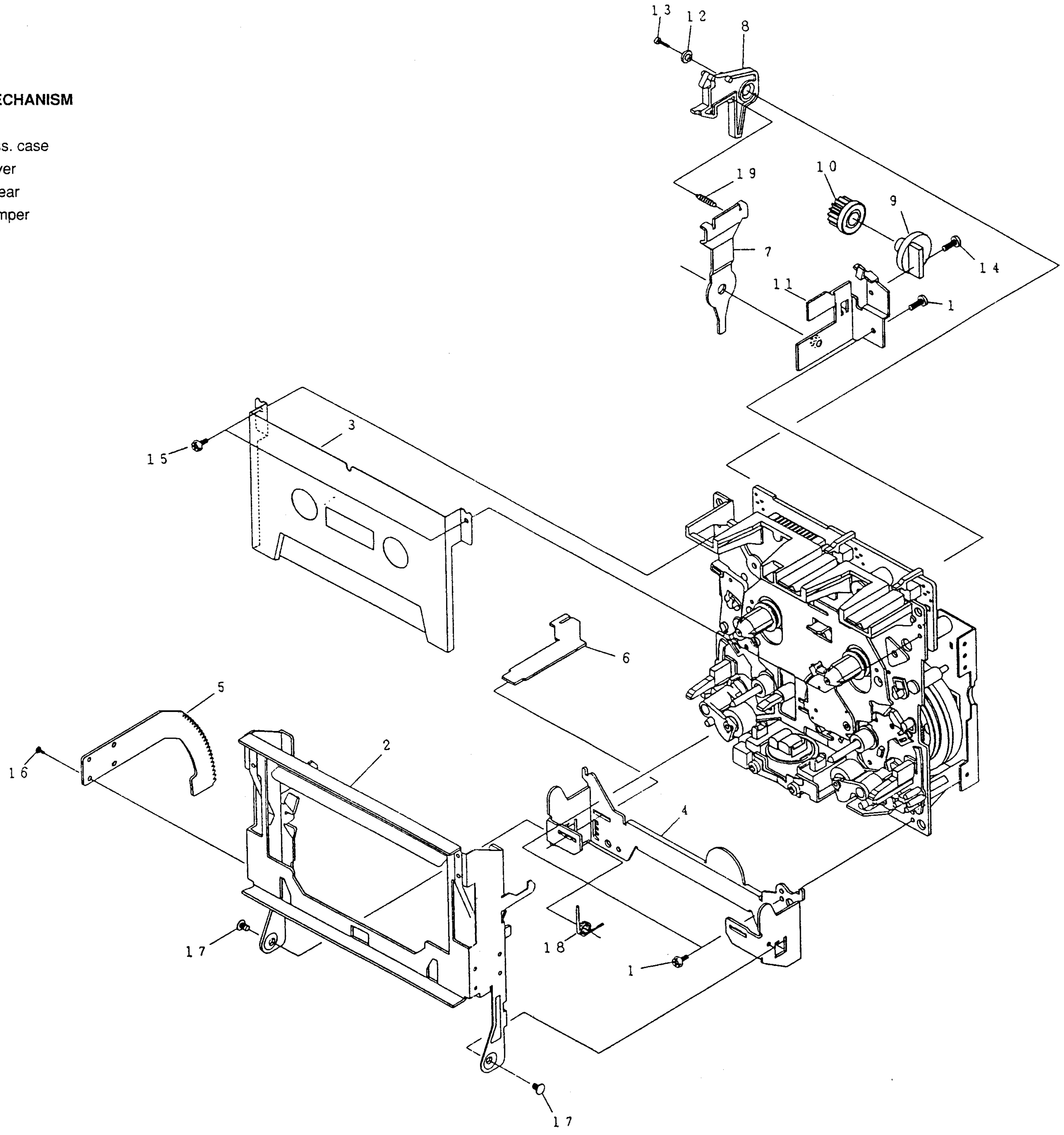
MECHANICAL AND ACCESSORY PARTS - SET EXPLODED VIEW

200	4822 426 51766	Cabinet front assy
204	4822 450 62323	Window assy
206	4822 410 63473	Button set DSC assy
208	4822 410 63474	Button set VOLUME
212	4822 410 63475	Button set CD assy
214	4822 410 63476	Button set LOGIC
215	4822 410 63471	Button EJECT tape
217	4822 410 63472	BUTTON set DBB
230	4822 462 40683	Plate (foot)
246	4822 532 60948	Bush
258	4822 403 30817	Bracket spacer
262	4822 410 63398	Button set TUNER unit
264	4822 423 90211	Cabinet top assy
302	4822 444 61013	Cover CD assy
304	4822 450 62322	Window cover
306	4822 443 64288	Cover cass
350	4822 445 10413	Loudspeaker box assy /20/22/25
350	4822 445 10419	Loudspeaker box assy /21/21M
351	4822 303 50063	FM aerial
352	4822 303 50082	AM frame aerial
356	4822 218 10562	Remote control
358	4822 321 10853	Main cord
387	4822 736 22208	IFU /20/22/25
387	4822 736 22241	IFU /21/21M
1030	4822 146 31411	Transformer
1063	4822 361 10689	DC brushless fan
1211	4822 272 10269	Voltage selector

EXPLODED VIEW - TAPE DECK MECHANISM

MECHANICAL PARTS - TAPE DECK MECHANISM

2	4822 691 20985	Assy cass. case
3	4822 426 20213	Plate cover
9	4822 256 92011	Holder gear
10	4822 529 10289	Gear dumper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ELECTRICAL PARTS - ECO4VA MINI BOARD

MISCELLANEOUS

1101	4822 267 10283	Socket IEC 75R not for USA
1104^	4822 267 31505	Antenna socket 300Ω
1105	4822 265 31184	Frame antenna connector

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2100	4822 122 33195	100pF 10% 50V not for USA
2104	4822 122 33195	100pF 10% 50V
2107	5322 122 34123	1nF 10% 50V
2110*	5322 122 32658	22pF 5% 50V
2112	4822 122 33496	100nF 10% 63V
2113*	4822 125 50355	Trimmer 4-20pF
2114*	5322 122 32531	100pF 5% 50V
2115	4822 125 60101	Trimmer 3-11pF 100V
2120	5322 122 32268	470pF 10% 50V
2121	5322 122 32481	15pF 5% 50V
2122	5322 122 34123	1nF 10% 50V
2123	5322 122 34123	1nF 10% 50V
2124	4822 121 51387	10nF 20% 16V
2125*	5322 122 31946	27pF 5% 63V
2126*	4822 122 33496	100nF 10% 63V
2129*	4822 121 43705	390pF 1% 160V
2134	4822 122 33197	1nF 10% 50V
2135	4822 121 70245	560pF 1% 160V
2136	5322 122 31946	27pF 5% 63V
2138	5322 122 32659	33pF 5% 50V
2139*	4822 122 33175	2.2nF 20% 50V
2141	4822 124 40244	2.2µF 20% 63V
2142	4822 124 40242	1µF 20% 63V
2143	4822 124 40239	0.47µF 20% 63V
2144	4822 124 40239	0.47µF 20% 63V
2147	4822 122 33177	10nF 20% 50V
2150	4822 124 40248	10µF 20% 63V
2151	4822 124 40248	10µF 20% 63V
2154	4822 122 33893	18nF 10% 63V
2154^	4822 122 32541	27nF 10% 63V
2155	4822 122 33893	18nF 10% 63V
2155^	4822 122 32541	27nF 10% 63V
2160	4822 124 40242	1µF 20% 63V
2161	4822 124 40242	1µF 20% 63V
2167	4822 122 33496	100nF 10% 63V
2169	5322 122 31863	330pF 5% 50V
2170	4822 126 11714	4.7nF 20%
2171	5322 126 10223	4.7nF 10% 63V
2172	4822 124 41631	1.5µF 50V
2173	4822 124 40433	47µF 20% 25V
2177*	4822 126 12882	100nF +80-20% 50V
2178	4822 122 33197	1nF 10% 50V
2179*	4822 122 33195	100pF 10% 50V
2180	5322 122 31946	27pF 5% 63V
2181	4822 122 32139	12pF 2% 63V
2183	4822 122 33496	100nF 10% 63V

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2184	4822 124 41584	100µF 20% 10V
2185	4822 122 33496	100nF 10% 63V
2186	5322 122 34123	1nF 10% 50V

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3106	4822 051 20104	100k 5% 0.1W
3107*	4822 051 20222	2k2 5% 0.1W
3108	4822 051 20104	100k 5% 0.1W
3109*	4822 051 20222	2k2 5% 0.1W
3112	4822 116 52176	10Ω 5% 0.5W
3119	4822 116 52224	470Ω 5% 0.5W
3120	4822 116 52289	5k6 5% 0.5W
3121	4822 051 20104	100k 5% 0.1W
3122	4822 051 20471	470Ω 5% 0.1W
3123	4822 051 20223	22k 5% 0.1W
3124*	4822 116 52256	2k2 5% 0.5W
3125*	4822 051 20472	4k7 5% 0.1W
3128	4822 117 10833	10k 1% 0.1W
3129*	4822 051 20472	4k7 5% 0.1W
3132	4822 116 52283	4k7 5% 0.5W
3141	4822 116 52215	220Ω 5% 0.5W
3142	4822 051 20222	2k2 5% 0.1W
3144	4822 117 10833	10k 1% 0.1W
3147	4822 051 20184	180k 5% 0.1W
3148	4822 100 11163	100k 30%lin 0.1W
3149	4822 051 20563	56k 5% 0.1W
3151	4822 116 52243	1k5 5% 0.5W
3153	4822 051 20683	68k 5% 0.1W for 2-band version
3156	4822 116 52233	10k 5% 0.5W
3157	4822 051 20273	27k 5% 0.1W
3159	4822 051 20563	56k 5% 0.1W
3162	4822 050 11002	1k 1% 0.4W
3163	4822 050 11002	1k 1% 0.4W
3167	4822 051 20008	0Ω Jumper (0805)
3170	4822 116 52283	4k7 5% 0.5W
3171	4822 051 20101	100Ω 5% 0.1W
3172	4822 051 20472	4k7 5% 0.1W
3173	4822 116 52244	15k 5% 0.5W
3174	4822 116 52233	10k 5% 0.5W
3175	4822 051 20104	100k 5% 0.1W
3176	4822 051 20101	100Ω 5% 0.1W
3177*	4822 116 52233	10k 5% 0.5W
3183	4822 051 20223	22k 5% 0.1W
3184	4822 051 20223	22k 5% 0.1W
3186	4822 051 20104	100k 5% 0.1W
3188	4822 051 10102	1k 2% 0.25W
3189	4822 116 52249	1k8 5% 0.5W
3190	4822 116 52249	1k8 5% 0.5W
3191	4822 116 52249	1k8 5% 0.5W
3192	4822 116 52249	1k8 5% 0.5W

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3193	4822 116 52256	2k2 5% 0.5W
3194	4822 116 52219	330Ω 5% 0.5W
3195	4822 116 52219	330Ω 5% 0.5W
3197	4822 116 52219	330Ω 5% 0.5W
3206#	4822 116 52215	220Ω 5% 0.5W
3211	4822 051 10008	0Ω 5% 0.25W
3212	4822 051 10008	0Ω 5% 0.25W
3213	4822 051 10008	0Ω 5% 0.25W
3221	4822 051 20008	0Ω Jumper (0805)
3222	4822 051 20008	0Ω Jumper (0805) for 2-band version
3224	4822 051 20008	0Ω Jumper (0805)
3226	4822 051 20008	0Ω Jumper (0805)
3228	4822 051 10008	0Ω 5% 0.25W
3229	4822 051 20008	0Ω Jumper (0805) for 2-band version
3231	4822 051 20008	0Ω Jumper (0805)
3235	4822 051 20008	0Ω Jumper (0805)
3236	4822 051 10008	0Ω 5% 0.25W for 2-band version
3237	4822 051 10008	0Ω 5% 0.25W
3238*	4822 051 20008	0Ω Jumper (0805)
3240	4822 051 10479	47Ω 2% 0.25W
3241	4822 051 20008	0Ω Jumper (0805) for 2-band version
3242	4822 051 10008	0Ω 5% 0.25W
3243	4822 051 20008	0Ω Jumper (0805) for 2-band version
3244	4822 051 20008	0Ω Jumper (0805)
3245*	4822 051 20008	0Ω Jumper (0805)
3246	4822 051 10008	0Ω 5% 0.25W
3247	4822 051 10008	0Ω 5% 0.25W
3248	4822 051 10008	0Ω 5% 0.25W

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5107	4822 157 71094	MW AntennaCoil. 3-BAND
5107	4822 157 63835	MW AntennaCoil. 2-BAND
5108	4822 157 71093	LW Antenna Coil
5109	4822 156 30947	RF Coil 1.5 T
5120	4822 156 30947	RF Coil 1.5 T
5122	4822 157 60517	Osc. Coil LW
5123	4822 157 60517	Osc. Coil MW
5125	4822 157 61898	0.47µH
5140	4822 158 60511	AM-IF Filter 450KHZ
5142	4822 157 70302	AM-IF Filter 450KHZ
5143	4822 242 70665	Ceram Filter 10.7MHZ
5144	4822 242 70665	Ceram Filter 10.7MHZ
5145	4822 242 81362	Cer Discriminator
5170	4822 242 72976	Ceramic Resonator 7.2MHZ

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6105	4822 130 83075	HN1V02H
6109	4822 130 82833	1SV228
6121^	4822 130 30621	1N4148 (UAW)
6122#	4822 130 30621	1N4148
6123^	4822 130 30621	1N4148 (UAW)
6124	4822 130 82833	1SV228 Tuning diode
6140	4822 130 30621	1N4148 (UAW)
6154	4822 130 30621	1N4148 (UAW)
6170	4822 130 30621	1N41480 for 2-band version
6174	4822 130 34233	BZX79-B5V1

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7102*	4822 130 42615	BC817-40 (UAW)
7104*	5322 130 42136	BC848C (UAW)
7105	4822 130 60093	2SA838B
7120	4822 130 60163	2SC1047
7121*	5322 130 42136	BC848C (UAW)
7123*	5322 130 42136	BC848C (UAW)
7128*	5322 130 42136	BC848C (UAW)
7140	4822 209 32701	TEA5712T/N2 (RF IC)
7168	5322 130 41983	BC858B
7170	5322 130 42136	BC848C (UAW)
7171	5322 130 42136	BC848C (UAW)
7172	5322 209 11517	PC74HCU04T Inverter
7173	4822 209 31998	LC7218M Synthesizer
7179*	5322 130 42136	BC848C (UAW)

* For 3-band version
# For 2-band version
^ For 2-band version(USA)

Note: Only the parts mention in this list are normal service spare parts.

ELECTRICAL PARTS - TUNER 92 (For /22 only)

MISCELLANEOUS

1101	4822 210 10492	FE415-G11
1110	4822 267 10283	Antenna socket

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2101	5322 122 34099	470pF 10% 63V
2102	5322 122 32268	470pF 10% 50V
2103	4822 124 40433	47μF 20% 25V
2104	4822 121 42408	220nF 5% 63V
2105	5322 122 32654	22nF 10% 63V
2108	5322 122 32654	22nF 10% 63V
2109	5322 122 32654	22nF 10% 63V
2110	5322 122 32654	22nF 10% 63V
2111	4822 122 32927	220nF +80-20% 50V
2112	5322 122 32654	22nF 10% 63V
2113	5322 122 32661	56pF 5% 50V
2114	5322 124 41431	22μF 20% 35V
2115	4822 124 40239	0.47μF 20% 63V
2116	5322 121 42386	100nF 5% 63V
2117	4822 122 33336	8.2nF 10% 50V
2118	4822 122 33336	8.2nF 10% 50V
2119	4822 124 40244	2.2μF 20% 63V
2120	4822 124 40244	2.2μF 20% 63V
2121	4822 124 40196	220μF 20% 16V
2123	4822 124 40246	4.7μF 20% 63V
2124	4822 124 40246	4.7μF 20% 63V
2125	4822 122 33177	10nF 20% 50V
2126	4822 122 31782	15nF 10% 50V
2127	5322 122 31863	330pF 5% 50V
2128	5322 116 80853	560pF 5% 63V
2129	4822 124 40242	1μF 20% 63V
2131	4822 124 40248	10μF 20% 63V
2140	4822 125 60102	Trimmer 5.2p-30pF 100V
2141	4822 125 60101	Trimmer 3p-11pF 100V
2143	5322 122 32531	100pF 5%
2142	4822 125 60102	5.2p-30pF 100V
2144	4822 121 42408	220nF 5% 63V
2145	4822 121 51263	510pF 1% 400V
2146	4822 121 70082	430pF 1% 400V
2147	5322 122 32654	22nF 10% 63V
2148	5322 122 32452	47pF 5% 63V
2149	4822 122 33177	10nF 20% 50V
2150	5322 122 32654	22nF 10% 63V
2151	5322 122 34099	470pF 10% 63V
2152	4822 124 40242	1μF 20% 63V
2153	5322 122 34099	470pF 10% 63V
2154	5322 122 32481	15pF 5% 50V
2155	5322 122 32965	18pF 5% 50V
2156	4822 124 40433	47μF 20% 25V
2158	5322 126 10223	4.7nF 10% 63V
2159	5322 126 10223	4.7nF 10% 63V
2160	4822 124 [illegible]	1.5μF 50V

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2161	4822 122 32927	220nF +80-20% 50V
2162	4822 126 11585	22nF +80-20% 25V
2196	5322 122 32448	10pF 5% 50V
2210	4822 124 41643	100μF 16V 20%
2215	5322 122 32268	470pF 10% 50V
2216	5322 122 32268	470pF 10% 50V
2221	5322 122 32268	470pF 10% 50V
2224	4822 122 33575	220pF 5% 50V
2225	4822 122 33575	220pF 5% 50V

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3101	4822 052 10478	4Ω7 5% 0.33W
3102	4822 051 20224	220k 5% 0.1W
3104	4822 051 20154	150k 5% 0.1W
3105	4822 051 20562	5k6 5% 0.1W
3106	4822 051 20829	82Ω 5% 0.1W
3107	4822 051 20008	0Ω 0 JUMP
3113	4822 053 10221	220Ω 5%
3114	4822 051 20332	3k3 5% 0.1W
3115	4822 051 20391	390Ω 5% 0.1W
3116	4822 051 20478	4Ω7 5% 0.1W
3117	4822 051 20331	330Ω 5% 0.1W
3118	4822 050 22201	220Ω 1% 0.6W
3120	4822 052 10229	22Ω 5% 0.33W
3121	4822 051 20272	2k7 5% 0.1W
3122	4822 051 20562	5k6 5% 0.1W
3123	4822 051 20223	22k 5% 0.1W
3124	4822 117 10833	10k 1% 0.1W
3125	4822 100 11213	Trimmer 22k 30% 0.1W
3126	4822 051 20123	12k 5% 0.1W
3127	4822 051 20182	1k8 5% 0.1W
3128	4822 051 20182	1k8 5% 0.1W
3129	4822 117 10833	10k 5%
3130	4822 116 52283	4k7 5% 0.5W
3131	4822 100 11319	Trimmer 4k7 30% 0.1W
3132	4822 117 10833	10k 1% 0.1W
3133	4822 051 20008	0Ω 0 JUMP
3134	4822 116 52289	5k6 5% 0.5W
3135	4822 051 10008	0Ω 5% 0.25W
3137	4822 116 52283	4k7 5% 0.5W
3138	4822 116 83922	150Ω 5% 1W
3139	4822 051 20008	0Ω 0 JUMP
3140	4822 051 20821	820Ω 5%
3141	4822 051 20182	1k8 5%
3142	4822 051 20472	4k7 5% 0.1W
3143	4822 051 20821	820Ω 5% 0.1W
3144	4822 051 20331	330Ω 5% 0.1W
3145	4822 051 20271	270Ω 5% 0.1W
3147	4822 116 52289	5k6 5% 0.5W
3148	4822 051 20104	100k 5% 0.1W
[illegible]	4822 051 20472	4k7 5% 0.1W

3150	4822 050 25601	560Ω 1% 0.6W
3151	4822 116 52283	4k7 5% 0.5W
3152	4822 117 10833	10k 1% 0.1W
3155	4822 050 22201	220Ω 1% 0.6W
3156	4822 051 20153	15k 5% 0.1W
3157	4822 051 20472	4k7 5% 0.1W
3158	4822 116 52283	4k7 5% 0.5W
3159	4822 051 20104	100k 5% 0.1W
3160	4822 051 20104	100k 5% 0.1W
3162	4822 050 22701	270Ω 1% 0.6W
3163	4822 117 10833	10k 1% 0.1W
3164	4822 051 10473	47k 2% 0.25W
3165	4822 050 11002	1k 1% 0.4W
3166	4822 050 11002	1k 1% 0.4W
3167	4822 050 11002	1k 1% 0.4W
3168	4822 051 20008	0Ω 0 JUMP
3170	4822 117 10833	10k 1% 0.1W
3171	4822 051 20223	22k 5% 0.1W
3172	4822 051 20472	4k7 5% 0.1W
3173	4822 051 20223	22k 5% 0.1W
3190	4822 051 20479	47Ω 5% 0.1W
3194	4822 051 20472	4k7 5% 0.1W
3196	4822 051 20008	0Ω 0 JUMP
3197	4822 051 20008	0Ω 0 JUMP
3198	4822 117 10833	10k 1% 0.1W
3200	4822 051 20008	0Ω 0 JUMP
3202	4822 051 20008	0Ω 0 JUMP
3223	4822 051 20474	470k 5% 0.1W
3225	4822 050 11002	1k 1% 0.4W
3229	4822 015 20008	0Ω 0 JUMP
3233	4822 051 10102	1k 2% 0.25W
3236	4822 051 20008	0Ω 0 JUMP
3238	4822 015 20008	0Ω 0 JUMP
3239	4822 051 20274	270k 5% 0.1W
3240	4822 051 20182	1k8 5%
3241	4822 051 20008	0Ω 0 JUMP

5103	4822 242 41309	Ceramic filter 10.7MHz
5104	4822 157 63029	IF Coil AM
5105	4822 157 63904	Q Detection Coil
5106	4822 157 71044	Birdy Coil
5107	4822 157 71094	MW Aerial Coil
5108	4822 157 63912	AM Oscillator
5109	4822 157 71093	LW Aerial Coil
5110	4822 242 71878	Ceramic filter 450KHz
5111	4822 242 81248	Resonator 19KHz
5112	4822 242 72976	Crystal 7.2MHz
5113	4822 242 41309	Ceramic filter 10.7MHz
5114	4822 157 51503	560µH 10%

6101	4822 130 34174	BZX79-C4V7
6102	4822 130 83075	HN1V02H
6110	4822 130 30621	1N4148

7103	4822 209 31001	LA1851N
7104	5322 130 60068	BC558C
7105	4822 209 30178	LC7218
7106	4822 130 41327	BC327-40
7107	5322 130 41982	BC848B
7108	4822 130 44196	BC548C
7109	4822 130 44196	BC548C
7110	5322 130 44779	BC338-40
7111	5322 130 41982	BC848B
7112	4822 130 60163	2SC1047
7113	4822 130 44196	BC548C
7114	5322 130 44779	BC338-40
7115	4822 130 41024	BF245B
7116	4822 130 60163	2SC1047
7125	4822 130 44197	BC558B

Note: Only the parts mentioned in this list are normal service spare parts.

MISCELLANEOUS

1810	4822 276 13503	Switch

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2752	5322 122 32531	100pF 5% 50V
2753	5322 122 32531	100pF 5% 50V
2762	5322 122 32658	22pF 5% 50V
2763	5322 122 32658	22pF 5% 50V
2764	5322 122 32658	22pF 5% 50V
2769	4822 124 80115	4.7µF 20% 25V
2770	4822 124 80115	4.7µF 20% 25V
2802	4822 122 33064	330nF 80% 25V
2803	4822 122 33515	82pF 5% 63V
2804	4822 122 33515	82pF 5% 63V
2805	5322 122 33538	150pF 2% 63V
2806	5322 122 31946	27pF 5% 63V
2807	5322 122 32452	47pF 5% 63V
2808	5322 122 32452	47pF 5% 63V
2809	5322 122 32452	47pF 5% 63V
2810	5322 122 32481	15pF 5% 50V
2811	5322 122 33538	150pF 2% 63V
2814	4822 126 12339	2.2nF 10%
2818	4822 124 80483	47µF 20% 6.3V
2820	5322 116 80853	560pF 5% 63V
2821	4822 126 10326	180pF 5% 63V
2822	5322 122 31863	330pF 5% 50V
2823	5322 122 31865	1.5nF 10% 63V
2824	4822 126 10326	180pF 5% 63V
2825	4822 122 33575	220pF 5% 50V
2826	4822 122 33575	220pF 5% 50V
2827	4822 122 33575	220pF 5% 50V
2828	4822 122 33575	220pF 5% 50V
2829	4822 122 33575	220pF 5% 50V
2830	4822 122 33575	220pF 5% 50V
2831	4822 124 80483	47µF 20% 6.3V
2833	4822 124 80483	47µF 20% 6.3V
2834	5322 122 32654	22nF 10% 63V
2836	4822 126 13098	5.6nF 20% 16V
2837	4822 122 10459	560pF 10% 50V
2838	4822 122 33496	100nF 10% 63V
2839	4822 121 51387	10nF 20% 16V
2840	4822 122 10576	1.8nF 10% 16V
2843	5322 124 41948	470nF 20% 50V
2847	4822 124 80934	33µF 20% 25V
2848	4822 124 80483	47µF 20% 6.3V
2849	4822 124 40433	47µF 20% 25V
2850	4822 124 80115	4.7µF 20% 25V
2851	4822 121 51387	10nF 20% 16V
2852	4822 122 33496	100nF 10% 63V
2853	5322 121 42386	100nF 5% 63V
2854	5322 122 32531	100pF 5% 50V
2856	5322 121 42661	330nF 5% 63V

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2857	5322 122 32452	47pF 5% 63V
2858	5322 122 32654	22nF 10% 63V
2859	4822 122 33496	100nF 10% 63V
2860	4822 124 80483	47µF 20% 6.3V
2861	5322 122 32658	22pF 5% 50V
2862	5322 122 32661	56pF 5% 50V
2864	4822 124 42433	330µF 20% 6.3V
2866	4822 124 42433	330µF 20% 6.3V
2867	4822 122 33496	100nF 10% 63V
2876	5322 122 34123	1nF 10% 50V
2877	5322 122 34123	1nF 10% 50V
2878	5322 122 32531	100pF 5% 50V
2879	5322 122 32531	100pF 5% 50V
2881	4822 122 33496	100nF 10% 63V
2883	4822 122 33064	330nF 80% 25V
2891	4822 122 33496	100nF 10% 63V
2892	4822 124 11423	4.7µF 20% 6.3V
2893	5322 122 32531	100pF 5% 50V
2894	5322 122 32531	100pF 5% 50V
2895	5322 122 32531	100pF 5% 50V
2897	5322 122 32838	82nF 10% 63V

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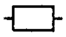
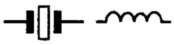
3750	4822 051 20154	150k 5% 0.1W
3751	4822 051 20331	330Ω 5% 0.1W
3752	4822 051 20221	220Ω 5% 0.1W
3754	4822 051 20105	1M 5% 0.1W
3755	4822 051 20103	10k 5% 0.1W
3760	4822 116 52296	6k8 5% 0.5W
3761	4822 116 52283	4k7 5% 0.5W
3762	4822 051 20221	220Ω 5% 0.1W
3763	4822 051 20221	220Ω 5% 0.1W
3764	4822 051 20221	220Ω 5% 0.1W
3785	4822 051 20103	10k 5% 0.1W
3790	4822 051 20103	10k 5% 0.1W
3791	4822 051 20103	10k 5% 0.1W
3792	4822 051 20103	10k 5% 0.1W
3793	4822 051 20103	10k 5% 0.1W
3794	Not Applicable	
3795	4822 051 20103	10k 5% 0.1W
3801	4822 116 52224	470Ω 5% 0.5W
3802	4822 051 10102	1k 2% 0.25W
3803	4822 051 20335	3M3 5% 0.1W
3804	4822 051 20682	6k8 5% 0.1W
3805	4822 051 20223	22k 5% 0.1W
3806	4822 051 20103	10k 5% 0.1W
3807	4822 051 20103	10k 5% 0.1W
3808	4822 051 20473	47k 5% 0.1W
3809	4822 051 20332	3k3 5% 0.1W
3810	4822 051 20332	3k3 5% 0.1W
3811	4822 051 20223	22k 5% 0.1W

3812	4822 051 20332	3k3 5% 0.1W
3813	4822 051 20332	3k3 5% 0.1W
3814	4822 051 20332	3k3 5% 0.1W
3815	4822 050 11002	1k 1% 0.4W
3818	4822 116 52233	10k 5% 0.5W
3820	4822 050 11002	1k 1% 0.4W
3821	4822 051 20124	120k 5% 0.1W
3822	4822 051 20563	56k 5% 0.1W
3823	4822 051 20331	330Ω 5% 0.1W
3824	4822 051 20124	120k 5% 0.1W
3825	4822 116 52233	10k 5% 0.5W
3826	4822 116 52233	10k 5% 0.5W
3827	4822 116 52233	10k 5% 0.5W
3828	4822 116 52233	10k 5% 0.5W
3829	4822 116 52233	10k 5% 0.5W
3830	4822 116 52233	10k 5% 0.5W
3831	4822 051 20223	22k 5% 0.1W
3832	4822 116 52175	100Ω 5% 0.5W
3833	4822 116 52233	10k 5% 0.5W
3834	4822 051 20229	22Ω 5% 0.1W
3835	4822 116 52264	27k 5% 0.5W
3836	4822 116 52207	1k2 5% 0.5W
3837	4822 116 52296	6k8 5% 0.5W
3838	4822 116 52257	22k 5% 0.5W
3839	4822 116 52207	1k2 5% 0.5W
3840	4822 116 52296	6k8 5% 0.5W
3841	4822 116 52297	68k 5% 0.5W
3842	4822 051 20182	1k8 5% 0.1W
3843	4822 116 52277	39k 5% 0.5W
3844	4822 050 11002	1k 1% 0.4W
3845	4822 116 52277	39k 5% 0.5W
3846	4822 050 11002	1k 1% 0.4W
3847	4822 116 40227 ⚠	4Ω6 25% 12V
3848	4822 050 11002	1k 1% 0.4W
3849	4822 052 10338 ⚠	3Ω3 5% 0.33W
3850	4822 050 11002	1k 1% 0.4W
3851	4822 116 52264	27k 5% 0.5W
3852	4822 050 11002	1k 1% 0.4W
3853	4822 116 52296	6k8 5% 0.5W
3854	4822 051 20103	10k 5% 0.1W
3855	4822 051 20224	220k 5% 0.1W
3856	4822 051 20223	22k 5% 0.1W
3857	4822 116 52215	220Ω 5% 0.5W
3858	4822 116 52215	220Ω 5% 0.5W
3860	4822 116 52175	100Ω 5% 0.5W
3862	4822 051 20105	1M 5% 0.1W
3863	4822 051 10102	1k 2% 0.25W
3864	4822 051 10102	1k 2% 0.25W
3865	4822 051 10102	1k 2% 0.25W
3866	4822 051 20331	330Ω 5% 0.1W
3867	4822 051 20472	4k7 5% 0.1W
3871	4822 116 52186	22Ω 5% 0.5W



3876	4822 116 52284	47k 5% 0.5W
3877	4822 116 52284	47k 5% 0.5W
3880	4822 050 11002	1k 1% 0.4W
3881	4822 050 11002	1k 1% 0.4W
3885	4822 051 20222	2k2 5% 0.1W
3886	4822 116 52226	560Ω 5% 0.5W
3887	4822 051 20473	47k 5% 0.1W
3889	4822 116 52233	10k 5% 0.5W
3890	4822 051 10102	1k 2% 0.25W
3891	4822 116 52186	22Ω 5% 0.5W
3892	4822 051 20103	10k 5% 0.1W
3893	4822 051 20103	10k 5% 0.1W
3894	4822 051 20103	10k 5% 0.1W
3895	4822 051 20103	10k 5% 0.1W
3896	4822 051 20103	10k 5% 0.1W
3897	Not Applicable	
3899	4822 051 20103	10k 5% 0.1W
4801	4822 051 10008	0Ω 5% 0.25W
4802	4822 051 10008	0Ω 5% 0.25W
4805	4822 051 10008	0Ω 5% 0.25W
4806	4822 051 10008	0Ω 5% 0.25W
4807	4822 051 10008	0Ω 5% 0.25W
4808	4822 051 10008	0Ω 5% 0.25W
4809	4822 051 10008	0Ω 5% 0.25W
4810	4822 051 10008	0Ω 5% 0.25W
4811	4822 051 10008	0Ω 5% 0.25W
4812	4822 051 10008	0Ω 5% 0.25W
4813	4822 051 10008	0Ω 5% 0.25W
4814	4822 051 10008	0Ω 5% 0.25W
4815	4822 051 10008	0Ω 5% 0.25W
4816	4822 051 10008	0Ω 5% 0.25W
4820	4822 051 10008	0Ω 5% 0.25W
4850	4822 051 10008	0Ω 5% 0.25W
4851	4822 051 10008	0Ω 5% 0.25W
4853	4822 051 10008	0Ω 5% 0.25W



5860	4822 242 81151	Crystal 16.9344MHz
5890	4822 242 72527	Ceramic resonator 4MHz

6857	4822 130 30621	1N4148
6881	4822 130 31981	BZX79-C3V9
6883	4822 130 31981	BZX79-C3V9

7800	5322 209 11517		PC74HCU04T
7820	4822 130 41344		BC337-40
7850	4822 209 31064		TDA1301T/N1
7851	4822 209 32852		TDA7073A/N2
7852	4822 209 32852		TDA7073A/N2
7855	4822 209 31519		TDA7072A
7856	5322 130 60123		BC807-40
7860	4822 209 33339		SAA7345GP/M5
7871	4822 209 32196		TDA1311AT/N2
7872	5322 130 42136		BC848C
7881	5322 130 41983		BC858B
7883	4822 130 44197		BC558B
7884	4822 130 41344		BC337-40
7885	4822 130 41344		BC337-40
7886	5322 209 86518	⚠	MC7805CT
7001	4822 209 80891	⚠	MC7805CT
7890	4822 209 33337		MC68HC05C8FB

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - COMBI BOARD

MISCELLANEOUS

1400	4822 130 91395	LCD Display
1460	4822 276 13114	Tact switch
1461	4822 276 13114	Tact switch
1462	4822 276 13114	Tact switch
1463	4822 276 13114	Tact switch
1464	4822 276 13114	Tact switch
1465	4822 276 13114	Tact switch
1466	4822 276 13114	Tact switch
1467	4822 276 13114	Tact switch
1468	4822 276 13114	Tact switch
1496	4822 134 41198	115mA 5V Blue
1497	4822 134 41198	115mA 5V Blue
1498	4822 134 41198	115mA 5V Blue
1499	4822 134 41198	115mA 5V Blue
1552	4822 267 30631	AUX/PHONO Socket
1560	4822 267 40898	Headphone Socket

2400	5322 122 32531	100pF 5% 50V
2401	4822 124 41525	100µF 20% 25V
2402	4822 124 40248	10µF 20% 63V
2403	4822 126 12333	100nF 20% 25V
2404	4822 126 11585	22nF +80-20% 25V
2405	5322 122 32658	22pF 5% 50V
2406	5322 122 32658	22pF 5% 50V
2407	5322 122 32452	47pF 5% 63V
2408	5322 122 32452	47pF 5% 63V
2409	5322 122 32452	47pF 5% 63V
2410	4822 122 33175	2.2nF 20% 50V
2411	5322 122 32452	47pF 5% 63V
2412	5322 122 32452	47pF 5% 63V
2413	5322 122 32452	47pF 5% 63V
2414	4822 124 41796	22µF 20% 16V
2415	4822 124 80818	22mF 5.5V
2416	4822 126 12787	330pF 10% 50V
2417	4822 122 33177	10nF 20% 50V
2418	4822 122 33175	2.2nF 20% 50V
2419	4822 124 41969	1µF 20% 50V
2420	5322 122 32658	22pF 5% 50V
2421	5322 122 32658	22pF 5% 50V
2502	4822 126 12333	100nF 20% 25V
2503	4822 126 12333	100nF 20% 25V
2504	4822 121 51299	1nF 10% 50V
2505	4822 121 51299	1nF 10% 50V
2506	4822 122 10577	3.3nF 10% 16V
2507	4822 122 10577	3.3nF 10% 16V
2508	5322 121 42661	330nF 5% 63V
2509	5322 121 42661	330nF 5% 63V
2510	4822 121 43526	47nF 5% 250V
2511	4822 121 43526	47nF 5% 250V
2512	4822 126 12145	47nF 10% 25V

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2513	4822 126 12145	47nF 10% 25V
2515	4822 124 22263	220µF 20% 25V
2516	4822 122 33195	100pF 10% 50V
2517	4822 122 33195	100pF 10% 50V
2518	4822 124 40242	1µF 20% 63V
2519	4822 124 40242	1µF 20% 63V
2520	4822 124 40242	1µF 20% 63V
2521	4822 124 40242	1µF 20% 63V
2522	4822 124 40246	4.7µF 20% 63V
2523	4822 124 40246	4.7µF 20% 63V
2524	5322 122 32531	100pF 5% 50V
2525	5322 122 32531	100pF 5% 50V
2526	4822 124 40242	1µF 20% 63V
2527	4822 124 40242	1µF 20% 63V
2528	4822 124 40242	1µF 20% 63V
2529	4822 124 40242	1µF 20% 63V
2530	5322 122 32531	100pF 5% 50V
2531	5322 122 32531	100pF 5% 50V
2532	4822 124 40433	47µF 20% 25V
2535	4822 126 11585	22nF +80-20% 25V
2538	4822 124 40246	4.7µF 20% 63V
2539	4822 124 40246	4.7µF 20% 63V
2541	4822 124 40248	10µF 20% 63V
2543	4822 124 40246	4.7µF 20% 63V
2544	4822 124 40242	1µF 20% 63V
2545	4822 124 40242	1µF 20% 63V
2546	4822 122 33175	2.2nF 20% 50V
2547	4822 124 40246	4.7µF 20% 63V
2548	4822 122 33175	2.2nF 20% 50V
2549	4822 122 33069	33pF 5% 50V
2559	4822 124 22263	220µF 20% 25V
2560	4822 124 40246	4.7µF 20% 63V
2561	4822 124 40246	4.7µF 20% 63V
2562	4822 124 40246	4.7µF 20% 63V
2563	4822 124 40246	4.7µF 20% 63V
2564	4822 124 41525	100µF 20% 25V
2565	4822 124 22263	220µF 20% 25V
2566	4822 124 41576	2.2µF 20% 50V
2567	4822 124 41576	2.2µF 20% 50V
2570	5322 122 34123	1nF 10% 50V
2571	5322 122 34123	1nF 10% 50V
2572	5322 122 34123	1nF 10% 50V
2600	5322 122 31863	330pF 5% 50V
2601	5322 122 31863	330pF 5% 50V
2602	5322 122 31863	330pF 5% 50V
2603	5322 122 31863	330pF 5% 50V
2604	4822 122 33849	150pF 10% 50V
2605	4822 122 33849	150pF 10% 50V
2606	4822 124 40242	1µF 20% 63V
2607	4822 124 40242	1µF 20% 63V
2608	4822 122 33175	2.2nF 20% 50V
2609	4822 122 33175	2.2nF 20% 50V

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2610	4822 122 32542	47nF 10% 63V
2611	4822 122 32542	47nF 10% 63V
2613	4822 124 41525	100µF 20% 25V
2614	4822 124 40242	1µF 20% 63V
2615	4822 124 40242	1µF 20% 63V
2616	5322 122 32531	100pF 5% 50V
2617	5322 122 32531	100pF 5% 50V
2618	4822 124 40242	1µF 20% 63V
2619	4822 124 40242	1µF 20% 63V
2620	4822 122 33175	2.2nF 20% 50V
2621	5322 122 32531	100pF 5% 50V
2622	5322 122 32531	100pF 5% 50V

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3400	4822 116 52224	470Ω 5% 0.5W
3401	4822 116 52224	470Ω 5% 0.5W
3402	4822 116 52224	470Ω 5% 0.5W
3406	4822 116 52257	22k 5% 0.5W
3407	4822 116 52284	47k 5% 0.5W
3408	4822 116 52233	10k 5% 0.5W
3409	4822 116 52233	10k 5% 0.5W
3410	4822 116 52224	470Ω 5% 0.5W
3411	4822 116 52224	470Ω 5% 0.5W
3412	4822 116 52224	470Ω 5% 0.5W
3413	4822 116 52224	470Ω 5% 0.5W
3414	4822 116 52224	470Ω 5% 0.5W
3416	4822 116 52224	470Ω 5% 0.5W
3418	4822 116 52233	10k 5% 0.5W
3420	4822 116 52233	10k 5% 0.5W
3421	4822 051 20682	6k8 5% 0.1W
3422	4822 050 11002	1k 1% 0.4W
3423	4822 050 11002	1k 1% 0.4W
3424	4822 050 11002	1k 1% 0.4W
3425	4822 050 11002	1k 1% 0.4W
3426	4822 050 11002	1k 1% 0.4W
3427	4822 050 11002	1k 1% 0.4W
3428	4822 050 11002	1k 1% 0.4W
3429	4822 116 52228	680Ω 5% 0.5W
3430	4822 050 11002	1k 1% 0.4W
3431	4822 051 20471	470Ω 5% 0.1W
3432	4822 116 52224	470Ω 5% 0.5W
3433	4822 051 20471	470Ω 5% 0.1W
3435	4822 051 20471	470Ω 5% 0.1W
3436	4822 051 20471	470Ω 5% 0.1W
3438	4822 051 20471	470Ω 5% 0.1W
3439	4822 051 10102	1k 2% 0.25W
3440	4822 051 10102	1k 2% 0.25W
3441	4822 050 11002	1k 1% 0.4W
3443	4822 051 10102	1k 2% 0.25W
3444	4822 051 10102	1k 2% 0.25W
3446	4822 051 10102	1k 2% 0.25W

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3447	4822 051 20221	220Ω 5% 0.1W
3448	4822 051 20222	2k2 5% 0.1W
3449	4822 051 10102	1k 2% 0.25W
3450	4822 116 52291	56k 5% 0.5W
3451	4822 116 52219	330Ω 5% 0.5W
3452	4822 116 90836	10Kx5(resnet)0.125W
3453	4822 116 90836	10Kx5(resnet)0.125W
3454	4822 116 90836	10Kx5(resnet)0.125W
3455	4822 116 52304	82k 5% 0.5W
3458	4822 116 52233	10k 5% 0.5W
3459	4822 116 52219	330Ω 5% 0.5W
3460	4822 116 52283	4k7 5% 0.5W
3461	4822 116 52257	22k 5% 0.5W
3462	4822 116 52283	4k7 5% 0.5W
3463	4822 116 52245	150k 5% 0.5W
3467	4822 116 52233	10k 5% 0.5W
3502	4822 116 52234	100k 5% 0.5W
3503	4822 116 52234	100k 5% 0.5W
3506	4822 051 20564	560k 5% 0.1W
3507	4822 051 20564	560k 5% 0.1W
3508	4822 051 20391	390Ω 5% 0.1W
3509	4822 116 52222	390Ω 5% 0.5W
3510	4822 117 11139	1k5 1% 0.1W
3511	4822 117 11139	1k5 1% 0.1W
3512	4822 116 52244	15k 5% 0.5W
3513	4822 116 52244	15k 5% 0.5W
3514	4822 051 20474	470k 5% 0.1W
3515	4822 051 20474	470k 5% 0.1W
3516	4822 051 20474	470k 5% 0.1W
3517	4822 051 20474	470k 5% 0.1W
3518	4822 051 20474	470k 5% 0.1W
3519	4822 051 20474	470k 5% 0.1W
3520	4822 051 20474	470k 5% 0.1W
3521	4822 051 20474	470k 5% 0.1W
3522	4822 051 20474	470k 5% 0.1W
3523	4822 051 20474	470k 5% 0.1W
3524	4822 051 20474	470k 5% 0.1W
3525	4822 051 20474	470k 5% 0.1W
3527	4822 052 10339 ⚠	33Ω 5% 0.33W
3528	4822 116 52271	33k 5% 0.5W
3529	4822 116 52271	33k 5% 0.5W
3530	4822 116 52235	1M 5% 0.5W
3531	4822 116 52235	1M 5% 0.5W
3532	4822 116 52271	33k 5% 0.5W
3533	4822 116 52271	33k 5% 0.5W
3534	4822 116 52271	33k 5% 0.5W
3535	4822 116 52271	33k 5% 0.5W
3536	4822 116 52269	3k3 5% 0.5W
3537	4822 116 52269	3k3 5% 0.5W
3538	4822 116 52258	220k 5% 0.5W
3539	4822 051 20224	220k 5% 0.1W
3540	4822 116 52258	220k 5% 0.5W

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3541	4822 051 20224	220k 5% 0.1W
3542	4822 116 52256	2k2 5% 0.5W
3543	4822 116 52256	2k2 5% 0.5W
3544	4822 116 52304	82k 5% 0.5W
3545	4822 116 52304	82k 5% 0.5W
3546	4822 116 52304	82k 5% 0.5W
3547	4822 051 20823	82k 5% 0.1W
3548	4822 116 52215	220Ω 5% 0.5W
3549	4822 116 52215	220Ω 5% 0.5W
3551	4822 116 52233	10k 5% 0.5W
3552	4822 051 20122	1k2 5% 0.1W
3553	4822 051 10102	1k 2% 0.25W
3554	4822 116 52297	68k 5% 0.5W
3555	4822 050 26802	6k8 1% 0.6W
3556	4822 116 52175	100Ω 5% 0.5W
3557	4822 050 11002	1k 1% 0.4W
3559	4822 050 11002	1k 1% 0.4W
3561	4822 116 52234	100k 5% 0.5W
3563	4822 116 52271	33k 5% 0.5W
3564	4822 116 52304	82k 5% 0.5W
3565	4822 116 52304	82k 5% 0.5W
3566	4822 051 20104	100k 5% 0.1W
3567	4822 116 52303	8k2 5% 0.5W
3568	4822 051 20104	100k 5% 0.1W
3569	4822 116 52234	100k 5% 0.5W
3571	4822 050 11002	1k 1% 0.4W
3572	4822 051 20223	22k 5% 0.1W
3573	4822 116 52303	8k2 5% 0.5W
3574	4822 051 20223	22k 5% 0.1W
3575	4822 050 11002	1k 1% 0.4W
3576	4822 116 52257	22k 5% 0.5W
3577	4822 116 52257	22k 5% 0.5W
3578	4822 051 20391	390Ω 5% 0.1W
3579	4822 116 52222	390Ω 5% 0.5W
3580	4822 051 20222	2k2 5% 0.1W
3581	4822 116 52256	2k2 5% 0.5W
3582	4822 116 52235	1M 5% 0.5W
3583	4822 116 52235	1M 5% 0.5W
3585	4822 116 52271	33k 5% 0.5W
3598	4822 052 10229 ⚠	22Ω 5% 0.33W
3599	4822 052 10339 ⚠	33Ω 5% 0.33W
3600	4822 116 52257	22k 5% 0.5W
3601	4822 116 52257	22k 5% 0.5W
3602	4822 051 20153	15k 5% 0.1W
3603	4822 051 20153	15k 5% 0.1W
3604	4822 116 52251	18k 5% 0.5W
3605	4822 116 52251	18k 5% 0.5W
3606	4822 051 20822	8k2 5% 0.1W
3607	4822 051 20822	8k2 5% 0.1W
3608	4822 116 52284	47k 5% 0.5W
3609	4822 116 52284	47k 5% 0.5W
3612	4822 116 52233	10k 5% 0.5W

3613	4822 116 52233	10k 5% 0.5W
3614	4822 116 52264	27k 5% 0.5W
3615	4822 116 52264	27k 5% 0.5W
3616	4822 051 20332	3k3 5% 0.1W
3617	4822 051 20332	3k3 5% 0.1W
3620	4822 050 11002	1k 1% 0.4W
3621	4822 050 11002	1k 1% 0.4W
3622	4822 116 52175	100Ω 5% 0.5W
3623	4822 116 52175	100Ω 5% 0.5W
3624	4822 051 20225	2M2 5% 0.1W
3625	4822 051 20225	2M2 5% 0.1W
3626	4822 051 10102	1k 2% 0.25W
3627	4822 051 10102	1k 2% 0.25W
3629	4822 052 10339 △	33Ω 5% 0.33W
3630	4822 116 52238	12k 5% 0.5W
3631	4822 116 52238	12k 5% 0.5W
3635	4822 116 52263	2k7 5% 0.5W
3636	4822 116 52263	2k7 5% 0.5W
3637	4822 116 52226	560Ω 5% 0.5W
3638	4822 116 52226	560Ω 5% 0.5W
3640	4822 116 52271	33k 5% 0.5W

5401	5322 242 73697	Ceramic resonator 8MHz
5402	4822 242 70938	Crystal 32.768MHz
5403	4822 157 52983	22µH 10%
5404	4822 157 50975	1mH 10%%
5405	4822 157 62552	2.2µH 20%
5406	4822 157 51503	560µH 10%
5407	4822 157 52983	22µH 10%
5409	4822 157 52983	22µH 10%
5410	4822 157 52983	22µH 10%
5411	4822 157 52983	22µH 10%
5412	4822 157 52983	22µH 10%
5413	4822 157 52983	22µH 10%
5414	4822 157 52983	22µH 10%
5415	4822 157 52983	22µH 10%
5416	4822 157 52983	22µH 10%
5503	4822 157 62552	2.2µH 20%
5504	4822 157 62552	2.2µH 20%

6400	4822 130 30621	1N4148 (UAW)
6402	4822 130 30621	1N4148 (UAW)
6403	4822 130 30621	1N4148 (UAW)
6404	4822 130 30621	1N4148 (UAW)
6405	4822 130 30621	1N4148 (UAW)
6406	4822 130 30621	1N4148 (UAW)
6407	4822 130 30621	1N4148 (UAW)

6408	4822 130 30621	1N4148 (UAW)
6409	4822 130 30621	1N4148 (UAW)
6410	4822 130 30621	1N4148 (UAW)
6411	4822 214 52009	GP1U58XP
6500	4822 130 30621	1N4148 (UAW)
6501	4822 130 30621	1N4148 (UAW)
6503	4822 130 30621	1N4148 (UAW)
6505	4822 130 30621	1N4148 (UAW)
6507	4822 130 30621	1N4148 (UAW)
6510	4822 130 30621	1N4148 (UAW)
6511	4822 130 30621	1N4148 (UAW)
6512	4822 130 30621	1N4148 (UAW)

7401	4822 209 33826	TMP87C20-FW17
7402	4822 209 31508	ST24C01
7404	5322 209 10421	HEF4094BP
7405	4822 130 40937	BC548B(UAW)
7406	4822 130 44196	BC548C(UAW)
7407	5322 209 10421	HEF4094BP
7408	4822 130 44197	BC558B(UAW)
7409	4822 130 44197	BC558B(UAW)
7410	4822 130 40937	BC548B(UAW)
7411	4822 130 40937	BC548B(UAW)
7502	4822 130 44246	BC549C
7503	4822 130 44246	BC549C
7504	5322 209 14865	MC14066BCP
7505	5322 209 14865	MC14066BCP
7506	4822 130 44246	BC549C
7507	4822 130 44246	BC549C
7510	4822 130 40937	BC548B(UAW)
7511	4822 130 40937	BC548B(UAW)
7512	4822 209 83274	NJM4560D
7513	4822 209 83274	NJM4560D
7515	4822 209 30537	TC9153P
7516	4822 130 40937	BC548B(UAW)
7517	4822 130 40937	BC548B(UAW)
7519	4822 130 40937	BC548B(UAW)
7520	5322 130 44779	BC338-40 (UAW)
7521	5322 130 44779	BC338-40 (UAW)
7526	4822 130 40937	BC548B
7600	4822 209 10263	4052B (UAW)
7602	4822 130 44246	BC549C
7603	4822 130 44246	BC549C

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - POWER BOARD

MISCELLANEOUS

1211	4822 272 10269$	Voltage selector
1260	4822 071 51602	Fuse T1.6A 250V
1305	4822 267 31176$	Loudspeaker socket
1360	4822 071 53152$	Fuse T3.15A 250V
1361	4822 071 53152$	Fuse T3.15A 250V
1362	4822 252 51168$	Fuse T80MA 250V
1470	4822 276 13114	Tact Swtich
1471	4822 276 13114	Tact Swtich
1472	4822 276 13114	Tact Swtich
1473	4822 276 13403	Tact Swtich
1474	4822 276 13114	Tact Swtich
1475	4822 276 13114	Tact Swtich
1477	4822 276 13114	Tact Swtich
1478	4822 276 13114	Tact Swtich
1479	4822 276 13114	Tact Swtich
1480	4822 276 13114	Tact Swtich
1481	4822 276 13114	Tact Swtich
1482	4822 276 13114	Tact Swtich
1483	4822 276 13114	Tact Swtich
1484	4822 276 13114	Tact Swtich
1485	4822 276 13114	Tact Swtich
1486	4822 276 13114	Tact Swtich
1487	4822 276 13114	Tact Swtich
1488	4822 276 13114	Tact Swtich
1489	4822 276 13114	Tact Swtich
1490	4822 276 13114	Tact Swtich
1491	4822 276 13114	Tact Swtich
1492	4822 276 13114	Tact Swtich

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2251	4822 124 40246	4.7µF 20% 63V
2252	4822 124 22263	220µF 20% 25V
2253	4822 124 42367	3300µF 20% 35V
2254	4822 124 41397	47µF 20% 25V
2255	4822 122 33197	1nF 10% 50V
2256	4822 122 10166	22nF 30% 16V
2257	4822 124 22263	220µF 20% 25V
2258	4822 124 41397	47µF 20% 25V
2259	4822 121 41853	100nF 10% 100V
2260	5322 121 42386	100nF 5% 63V
2261	5322 121 42386	100nF 5% 63V
2262	4822 124 22263	220µF 20% 25V
2264	4822 124 41397	47µF 20% 25V
2265	4822 124 41525	100µF 20% 25V
2266	4822 124 41397	47µF 20% 25V
2267	4822 124 41525	100µF 20% 25V
2268	4822 124 41525	100µF 20% 16V
2269	4822 124 40242	1µF 20% 63V
2270	4822 122 33197	1nF 10% 50V
2271	4822 124 22263	220µF 20% 25V
2272	4822 124 40242	1µF 20% 63V

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2351	4822 124 41407	0.47µF 20% 63V
2352	4822 124 41407	0.47µF 20% 63V
2353	4822 124 41576	2.2µF 20% 50V
2354	4822 124 41576	2.2µF 20% 50V
2355	4822 122 33195	100pF 10% 50V
2356	4822 122 33195	100pF 10% 50V
2357	4822 124 22347	47µF 20% 50V
2358	4822 124 22347	47µF 20% 50V
2359	4822 122 10459	560pF 10% 50V
2360	4822 122 10459	560pF 10% 50V
2363	4822 124 22347	47µF 20% 50V
2365	4822 124 22347	47µF 20% 50V
2366	4822 124 22347	47µF 20% 50V
2367	4822 121 41853	100nF 10% 100V
2368	4822 121 41853	100nF 10% 100V
2371	4822 124 41407	0.47µF 20% 63V
2372	4822 124 41407	0.47µF 20% 63V
2373	5322 121 41854	150nF 10% 63V
2374	5322 121 41854	150nF 10% 63V
2380	4822 126 12785	47nF TUB 50V
2381	4822 124 41596	22µF 20% 50V
2390	4822 121 41853	100nF 10% 100V
2391	5322 121 42386	100nF 5% 63V
2392	5322 121 42386	100nF 5% 63V
2393	4822 124 42367	3300µF 20% 35V
2394	4822 124 42367	3300µF 20% 35V
2395	4822 121 41853	100nF 10% 100V
2397	4822 124 41596	22µF 20% 50V
2399	4822 124 42245	22µF 20% 63V

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3251	4822 116 52233	10k 5% 0.5W
3252	4822 116 52234	100k 5% 0.5W
3253	4822 050 11002	1k 1% 0.4W
3255	4822 050 11002	1k 1% 0.4W
3256	4822 116 52233	10k 5% 0.5W
3257	4822 050 11002	1k 1% 0.4W
3258	4822 050 11002	1k 1% 0.4W
3259	4822 050 11002	1k 1% 0.4W
3261	4822 116 52283	4k7 5% 0.5W
3262	4822 116 52233	10k 5% 0.5W
3263	4822 050 11002	1k 1% 0.4W
3264	4822 116 52291	56k 5% 0.5W
3265	4822 050 11002	1k 1% 0.4W
3266	4822 116 52283	4k7 5% 0.5W
3267	4822 116 52271	33k 5% 0.5W
3268	4822 116 52233	10k 5% 0.5W
3269	4822 116 52233	10k 5% 0.5W
3270	4822 116 52233	10k 5% 0.5W
3273	4822 116 52244	15k 5% 0.5W
3274	4822 053 10101	100Ω 5% 1W

3275	4822 116 52233	10k 5% 0.5W
3276	4822 116 52186	22Ω 5% 0.5W
3277	4822 116 52233	10k 5% 0.5W
3278	4822 050 21801 △	180Ω 1% 0.6W
3279	4822 116 52233	10k 5% 0.5W
3280	4822 116 52289	5k6 5% 0.5W
3300	4822 116 52233	10k 5% 0.5W
3301	4822 116 52233	10k 5% 0.5W
3302	4822 116 52291	56k 5% 0.5W
3303	4822 116 52291	56k 5% 0.5W
3304	4822 116 52224	470Ω 5% 0.5W
3305	4822 116 52224	470Ω 5% 0.5W
3306	4822 052 10101 △	100Ω 5% 0.33W
3307	4822 116 52263	2k7 5% 0.5W
3308	4822 116 52291	56k 5% 0.5W
3309	4822 116 52291	56k 5% 0.5W
3310	4822 116 52256	2k2 5% 0.5W
3311	4822 116 52256	2k2 5% 0.5W
3312	4822 053 10221	220Ω 5% 1W
3314	4822 116 52256	2k2 5% 0.5W
3315	4822 116 52256	2k2 5% 0.5W
3316	4822 052 10478 △	4Ω7 5% 0.33W
3317	4822 052 10478 △	4Ω7 5% 0.33W
3324	4822 116 52291	56k 5% 0.5W
3325	4822 116 52291	56k 5% 0.5W
3326	4822 050 21008	1Ω 1% 0.6W
3327	4822 050 21008	1Ω 1% 0.6W
3328	4822 050 21008	1Ω 1% 0.6W
3329	4822 050 21008	1Ω 1% 0.6W
3330	4822 050 21008	1Ω 1% 0.6W
3331	4822 050 21008	1Ω 1% 0.6W
3332	4822 050 21008	1Ω 1% 0.6W
3333	4822 050 21008	1Ω 1% 0.6W
3334	4822 050 21008	1Ω 1% 0.6W
3335	4822 050 21008	1Ω 1% 0.6W
3336	4822 116 52284	47k 5% 0.5W
3337	4822 116 52284	47k 5% 0.5W
3338	4822 052 10228 △	2Ω2 5% 0.33W
3339	4822 052 10228 △	2Ω2 5% 0.33W
3340	4822 050 11002	1k 1% 0.4W
3341	4822 050 11002	1k 1% 0.4W
3344	4822 113 80525 △	O.15Ω 10% 3W
3345	4822 116 52256	2k2 5% 0.5W
3346	4822 116 52233	10k 5% 0.5W
3347	4822 116 52234	100k 5% 0.5W
3348	4822 116 52256	2k2 5% 0.5W
3349	4822 116 52257	22k 5% 0.5W
3350	4822 116 52284	47k 5% 0.5W
3351	4822 116 52296	6k8 5% 0.5W
3352	4822 116 52292	560k 5% 0.5W
3353	4822 116 52292	560k 5% 0.5W
3356	4822 116 52296	6k8 5% 0.5W

3357	4822 116 52296	6k8 5% 0.5W
3358	4822 050 11002	1k 1% 0.4W
3359	4822 050 11002	1k 1% 0.4W

5281	4822 157 71285	400µH 30%
5313	4822 280 80777	Relay 2P 12V 7A

6251	4822 130 30621	1N4148 (UAW)
6252	4822 130 30621	1N4148 (UAW)
6253	4822 130 30621	1N4148 (UAW)
6254	4822 130 30621	1N4148 (UAW)
6255	4822 130 30621	1N4148 (UAW)
6256	4822 130 34174	BZX79-F4V7 (UAW)
6257	5322 130 80686	1N5392
6258	5322 130 80686	1N5392
6259	5322 130 80686	1N5392
6260	5322 130 80686	1N5392
6261	4822 130 31981	BZX79-C3V9 (UAW)
6262	4822 130 30621	1N4148 (UAW)
6263	4822 130 30621	1N4148 (UAW)
6264	4822 130 30621	1N4148 (UAW)
6266	5322 130 31504	BZX79-C3V3 (UAW)
6267	4822 130 30621	1N4148 (UAW)
6351	4822 130 30621	1N4148 (UAW)
6353	4822 130 30621	1N4148 (UAW)
6360	4822 130 82078	D5SBA20
6365	4822 130 30621	1N4148 (UAW)
6366	4822 130 31253	BZX79-C2V4 (UAW)
6401	4822 130 82978	LTL-16KPE

7251	4822 130 40937	BC548B(UAW)
7252	4822 130 40823	BD135(UAW)
7253	4822 130 61236	BD234
7254	4822 130 44197	BC558B(UAW)
7255	4822 130 41344	BC337-40
7256	4822 130 40937	BC548B(UAW)
7258	4822 209 72042	MC78L05ACP
7259	4822 130 40937	BC548B(UAW)
7260	4822 130 40937	BC548B(UAW)
7261	4822 209 80817	L7805CV
7262	4822 130 40937	BC548B(UAW)
7301	4822 209 31514	STK4132II
7303	4822 130 40937	BC548B(UAW)
7304	4822 130 44197	BC558B(UAW)
7305	4822 130 40937	BC548B(UAW)
7306	4822 130 44197	BC558B(UAW)

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - ETF3 BOARD

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2650	4822 124 40248	10µF 20% 63V
2651	4822 124 40248	10µF 20% 63V
2652	4822 124 40242	1µF 20% 63V
2653	4822 124 40242	1µF 20% 63V
2654	4822 122 33891	3.3nF 10% 63V
2655	4822 122 33891	3.3nF 10% 63V
2656	5322 122 32452	47pF 5% 63V
2657	5322 122 32452	47pF 5% 63V
2658	5322 122 32452	47pF 5% 63V
2659	5322 122 32452	47pF 5% 63V
2660	4822 124 40244	2.2µF 20% 63V
2661	4822 124 40244	2.2µF 20% 63V
2668	5322 121 42498	680nF 5% 63V
2669	5322 121 42498	680nF 5% 63V
2672	4822 124 41551	100µF 20% 25V
2673	4822 124 41525	100µF 20% 25V
2674	4822 122 33496	100nF 10% 63V
2675	4822 122 33496	100nF 10% 63V
2682	4822 124 40242	1µF 20% 63V
2683	4822 124 40242	1µF 20% 63V
2684	5322 122 32452	47pF 5% 63V
2685	5322 122 32452	47pF 5% 63V
2686	5322 122 32659	33pF 5% 50V
2687	5322 122 32659	33pF 5% 50V
2688	4822 124 41525	100µF 20% 25V
2690	4822 124 40248	10µF 20% 63V
2692	4822 124 40242	1µF 20% 63V
2693	4822 124 40242	1µF 20% 63V
2702	4822 122 33173	560pF 10% 50V
2703	4822 122 33173	560pF 10% 50V
2706	5322 122 34099	470pF 10% 63V
2707	5322 122 34099	470pF 10% 63V
2708	4822 124 41525	100µF 20% 25V
2709	4822 124 41525	100µF 20% 25V
2710	4822 122 33128	15nF 10% 63V
2711	4822 122 33128	15nF 10% 63V
2712	5322 122 34123	1nF 10% 50V
2713	5322 122 34123	1nF 10% 50V
2714	4822 124 40248	10µF 20% 63V
2715	4822 124 40248	10µF 20% 63V
2716	4822 124 41525	100µF 20% 25V
2717	4822 124 22263	220µF 20% 25V
2718	4822 124 40248	10µF 20% 63V
2730	4822 122 33515	82pF 5% 63V
2731	4822 122 33515	82pF 5% 63V
2732	4822 122 33806	820pF 10% 63V
2733	4822 122 33806	820pF 10% 63V
2734	5322 122 32654	22nF 10% 63V
2735	5322 122 32654	22nF 10% 63V
2736	4822 122 33177	10nF 20% 50V
2737	4822 122 33177	10nF 20% 50V
2738	4822 124 40242	1µF 20% 63V

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2739	4822 124 40242	1µF 20% 63V
2740	4822 124 40246	4.7µF 20% 63V
2741	4822 124 40246	4.7µF 20% 63V
2742	4822 124 40242	1µF 20% 63V
2743	4822 124 40242	1µF 20% 63V
2744	5322 122 34123	1nF 10% 50V
2745	5322 122 34123	1nF 10% 50V
2746	4822 121 51252	470nF 5% 63V
2747	4822 121 51252	470nF 5% 63V
2748	4822 124 40248	10µF 20% 63V
2749	4822 124 40248	10µF 20% 63V
2750	4822 124 40433	47µF 20% 25V
2751	4822 124 40242	1µF 20% 63V
2752	5322 126 10223	4.7nF 10% 63V
2753	5322 126 10223	4.7nF 10% 63V
2754	5322 126 10223	4.7nF 10% 63V
2755	4822 124 41525	100µF 20% 25V
2756	4822 124 40246	4.7µF 20% 63V
2757	4822 124 22263	220µF 20% 25V
2760	5322 122 32659	33pF 5% 50V
2761	5322 122 32659	33pF 5% 50V
2762	5322 121 42975	15nF 5% 250V
2763	4822 124 40239	0.47µF 63V 20%
2764	5322 126 10223	4.7nF 10% 63V
2765	4822 122 33177	10nF 20% 50V
2766	4822 124 40246	4.7µF 20% 63V
2768	4822 124 41525	100µF 20% 25V
2791	5322 122 34123	1nF 10% 50V
2796	5322 122 32654	22nF 10% 63V
2797	4822 124 40242	1µF 20% 63V
2799	4822 124 41584	100µF 20% 10V
2782	4822 122 33342	33nF 10% 63V
2787	4822 122 33342	33nF 10% 63V
2800	4822 124 41525	100µF 20% 25V
2808	4822 124 40244	2.2µF 20% 63V

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3501	4822 051 10008	0Ω 5% 0.25W
3650	4822 051 20104	100k 5% 0.1W
3651	4822 051 20104	100k 5% 0.1W
3654	4822 100 11771	20k 30%lin 0.1W
3655	4822 100 11771	20k 30%lin 0.1W
3656	4822 051 10102	1k 2% 0.25W
3657	4822 051 10102	1k 2% 0.25W
3658	4822 050 11002	1k 1% 0.4W
3659	4822 050 11002	1k 1% 0.4W
3660	4822 050 11002	1k 1% 0.4W
3661	4822 050 11002	1k 1% 0.4W
3662	4822 051 20562	5k6 5% 0.1W
3663	4822 051 20562	5k6 5% 0.1W
3664	4822 051 20153	15k 5% 0.1W

3665	4822 051 20153	15k 5% 0.1W
3666	4822 116 52264	27k 5% 0.5W
3667	4822 116 52264	27k 5% 0.5W
3673	4822 051 20393	39k 5% 0.1W
3674	4822 052 10478	4Ω7 5% 0.33W
3675	4822 117 11139	1k5 1% 0.1W
3678	4822 051 20474	470k 5% 0.1W
3679	4822 051 20474	470k 5% 0.1W
3680	4822 117 11139	1k5 1% 0.1W
3681	4822 117 11139	1k5 1% 0.1W
3682	4822 051 20471	470Ω 5% 0.1W
3688	4822 051 20332	3k3 5% 0.1W
3689	4822 051 20332	3k3 5% 0.1W
3690	4822 051 20008	0Ω 0 JUMP. (0805)
3691	4822 051 20008	0Ω 0 JUMP. (0805)
3692	4822 051 20008	0Ω 0 JUMP. (0805)
3693	4822 051 20008	0Ω 0 JUMP. (0805)
3694	4822 051 20223	22k 5% 0.1W
3695	4822 051 20223	22k 5% 0.1W
3696	4822 051 20223	22k 5% 0.1W
3697	4822 051 20223	22k 5% 0.1W
3699	4822 051 20392	3k9 5% 0.1W
3700	4822 116 52224	470Ω 5% 0.5W
3701	4822 116 52224	470Ω 5% 0.5W
3702	4822 051 20471	470Ω 5% 0.1W
3703	4822 116 52224	470Ω 5% 0.5W
3704	4822 051 20154	150k 5% 0.1W
3705	4822 051 20154	150k 5% 0.1W
3706	4822 051 20479	47Ω 5% 0.1W
3707	4822 051 20479	47Ω 5% 0.1W
3708	4822 116 52233	10k 5% 0.5W
3709	4822 051 20103	10k 5% 0.1W
3710	4822 116 52289	5k6 5% 0.5W
3711	4822 051 20562	5k6 5% 0.1W
3720	4822 051 20008	0Ω 0 JUMP. (0805)
3721	4822 051 20008	0Ω 0 JUMP. (0805)
3722	4822 116 52224	470Ω 5% 0.5W
3723	4822 116 52224	470Ω 5% 0.5W
3724	4822 116 52245	150k 5% 0.5W
3730	4822 116 52233	10k 5% 0.5W
3731	4822 116 52233	10k 5% 0.5W
3732	4822 116 52175	100Ω 5% 0.5W
3733	4822 116 52175	100Ω 5% 0.5W
3734	4822 116 52284	47k 5% 0.5W
3735	4822 116 52284	47k 5% 0.5W
3736	4822 116 52233	10k 5% 0.5W
3737	4822 116 52233	10k 5% 0.5W
3738	4822 100 11771	20k 30%lin 0.1W
3739	4822 100 11771	20k 30%lin 0.1W
3740	4822 051 20562	5k6 5% 0.1W
3741	4822 051 20562	5k6 5% 0.1W
3742	4822 051 20223	22k 5% 0.1W

3743	4822 051 20223	22k 5% 0.1W
3744	4822 051 20273	27k 5% 0.1W
3745	4822 051 10102	1k 2% 0.25W
3746	4822 051 10102	1k 2% 0.25W
3747	4822 051 10102	1k 2% 0.25W
3748	4822 116 52271	33k 5% 0.5W
3749	4822 116 52219	330Ω 5% 0.5W
3760	4822 051 20109	10Ω 5% 0.1W
3761	4822 051 20109	10Ω 5% 0.1W
3762	4822 100 11163	100k 30%lin 0.1W
3763	4822 100 11163	100k 30%lin 0.1W
3764	4822 051 20339	33Ω 5% 0.1W
3765	4822 051 20682	6k8 5% 0.1W
3766	4822 051 20159	15Ω 5% 0.1W
3767	4822 051 20223	22k 5% 0.1W
3768	4822 051 10102	1k 2% 0.25W
3769	4822 117 10833	10k 1% 0.1W
3770	4822 051 20392	3k9 5% 0.1W
3771	4822 051 20221	220Ω 5% 0.1W
3772	4822 117 10833	10k 1% 0.1W
3773	4822 052 10478	4Ω7 5% 0.33W
3774	4822 116 52257	22k 5% 0.5W
3786	4822 051 10102	1k 2% 0.25W
3787	4822 051 10102	1k 2% 0.25W
3789	4822 051 20104	100k 5% 0.1W
3790	4822 051 20104	100k 5% 0.1W
3792	4822 116 52284	47k 5% 0.5W
3793	4822 116 52284	47k 5% 0.5W
3795	4822 051 20183	18k 5% 0.1W
3800	4822 050 11002	1k 1% 0.4W
3801	4822 050 11002	1k 1% 0.4W
3802	4822 050 11002	1k 1% 0.4W
3803	4822 116 52175	100Ω 5% 0.5W
3804	4822 116 52215	220Ω 5% 0.5W
3805	4822 051 10102	1k 2% 0.25W
3806	4822 117 10833	10k 1% 0.1W
3807	4822 051 20103	10k 5% 0.1W
3808	4822 117 10833	10k 1% 0.1W
3809	4822 117 10833	10k 1% 0.1W
3810	4822 117 10833	10k 1% 0.1W
3811	4822 051 20472	4k7 5% 0.1W
3812	4822 051 20392	3k9 5% 0.1W
3813	4822 117 10833	10k 1% 0.1W
3814	4822 051 20105	1M 5% 0.1W
3822	4822 050 11002	1k 1% 0.4W
3823	4822 050 11002	1k 1% 0.4W
3824	4822 050 11002	1k 1% 0.4W
3825	4822 050 11002	1k 1% 0.4W
3826	4822 050 11002	1k 1% 0.4W
3827	4822 117 10834	47k 1% 0.1W
3828	4822 117 10833	10k 1% 0.1W
3829	4822 051 10102	1k 2% 0.25W

3830	4822 051 10102	1k 2% 0.25W
3831	4822 051 10102	1k 2% 0.25W
3832	4822 051 20008	0Ω 0 JUMP. (0805)
3833	4822 117 10833	10k 1% 0.1W
3836	4822 051 10102	1k 2% 0.25W
3837	4822 116 52233	10k 5% 0.5W
3839	4822 052 10159	15Ω 5% 0.33W
3842	4822 051 20223	22k 5% 0.1W
3844	4822 051 20223	22k 5% 0.1W
3856	4822 116 52233	10k 5% 0.5W
3857	4822 117 10833	10k 1% 0.1W
3858	4822 051 20474	470k 5% 0.1W
3859	4822 117 10833	10k 1% 0.1W
3866	4822 051 20103	10k 5% 0.1W
3868	4822 051 20103	10k 5% 0.1W

5650	4822 156 21725	MPX filter LDX-210
5651	4822 156 21725	MPX filter LDX-210
5730	4822 156 20811	Ind. fixed 36mH 5%
5731	4822 156 20811	Ind. fixed 36mH 5%
5760	4822 156 20946	Osc. coil 100kHz
5780	4822 242 72527	Ceramic resonator 4MHz
5790	4822 157 53941	Ind. fixed 100µH 10%

6650	4822 130 34233	BZX79-C5V1 (UAW)
6760	4822 130 61219	BZX79-C10 (UAW)
6781	5322 130 30684	1N4002
6782	4822 130 30621	1N4148 (UAW)
6783	4822 130 30621	1N4148 (UAW)
6784	4822 130 30621	1N4148

7650	4822 209 32919	HEF4952BT
7651	4822 209 72546	CXA1101
7652	5322 130 42136	BC848C (UAW)
7653	5322 130 42136	BC848C (UAW)
7654	5322 130 42136	BC848C (UAW)
7655	5322 130 42136	BC848C (UAW)
7701	4822 209 61667	UPC1330HA
7702	4822 209 32918	AN7318S
7703	5322 209 11102	HEF4052BT
7730	4822 209 31505	CXA1298AP
7760	5322 130 44779	BC338-40 (UAW)
7761	5322 130 44779	BC338-40 (UAW)
7762	4822 130 44196	BC548C(UAW)
7763	4822 130 44196	BC548C(UAW)
7764	4822 130 42682	DTA144ES
7765	4822 130 60588	DTC114ES
7781	4822 130 41715	BC328-40 (UAW)
7782	4822 130 41715	BC328-40 (UAW)
7784	5322 130 42136	BC848C (UAW)
7785	5322 130 42136	BC848C (UAW)
7787	5322 130 42136	BC848C (UAW)
7792	4822 209 72042	MC78L05ACP
7793	4822 209 33623	MC68HC05C4 ETF3

Note: Only the parts mentioned in this list are normal service spare parts.

4902

FW17/20/21/21M/22/25

A95 - 165

Service
Service
Service

Product Service Group CE Audio

Service Information

Already published informations: *A95-159 (4822 725 25176)*

GB

To adapt the service manual the following sheets have been added/changed.

F

Afin de pouvoir adapter le "manual service" les feuillets suivants ont été soit modifiés, soit ajoutés.

NL

Voor het aanpassen van de service manual zijn de onderstaande pagina's toegevoegd/gewijzigd.

D

Zür anpassung des Service Manual sind die nachstehenden Seiten hinzugefügt/geändert.

I

Le seguenti pagine sono state cambiate/aggiunte allo scopo di adattare il Manuale di Servizio.

Introduction of DAC IC TDA 1549T on CD board.
With its introduction the following changes are made:

Combi Board

Change	3606 to	3k3 5% 0.1W	4822 051 20332
	3607 to	3k3 5% 0.1W	4822 051 20332

CD board

Change	2864 to	47µF 20% 6.3V	4822 124 80483
	2866 to	47µF 20% 6.3V	4822 124 80483
	3867 to	100Ω 5% 0.1W	4822 051 20101
Add	2863	33nF 10% 63V	4822 122 33342
	2865	47µF 20% 6.3V	4822 124 80483
	2868	1nF 10% 50V	5322 122 34123
	2869	1nF 10% 50V	5322 122 34123
	3767	1k 1% 0.4W	4822 050 11002
	3770	1k 1% 0.4W	4822 050 11002
	3868	100Ω 5% 0.1W	4822 051 20101
	7870	TDA1549T/N1	4822 209 33252
Delete	3795		
	7871		
	7872		

Updated portion of the CD schematics and layout drawings are given in figure 1 to 3.

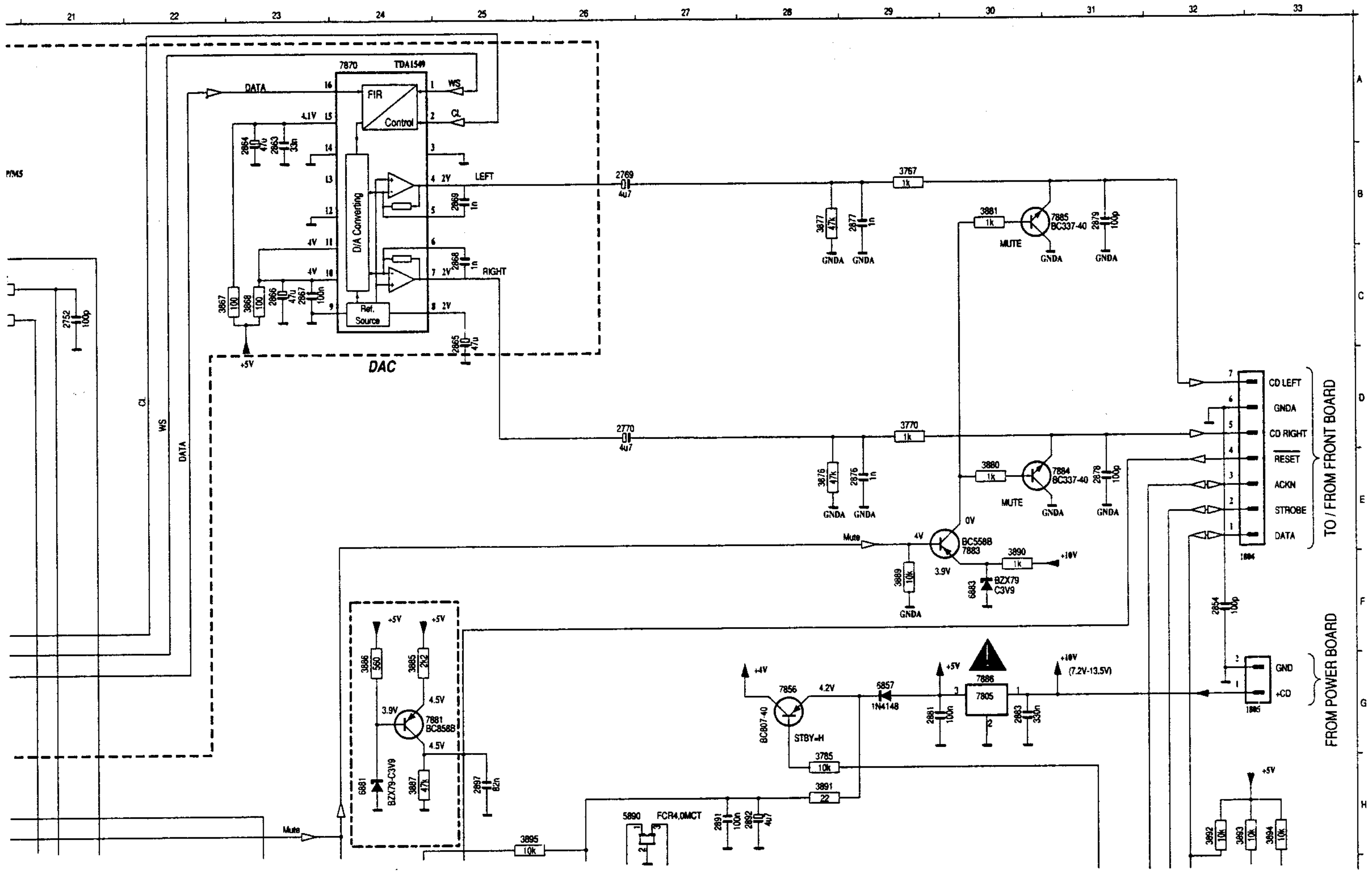
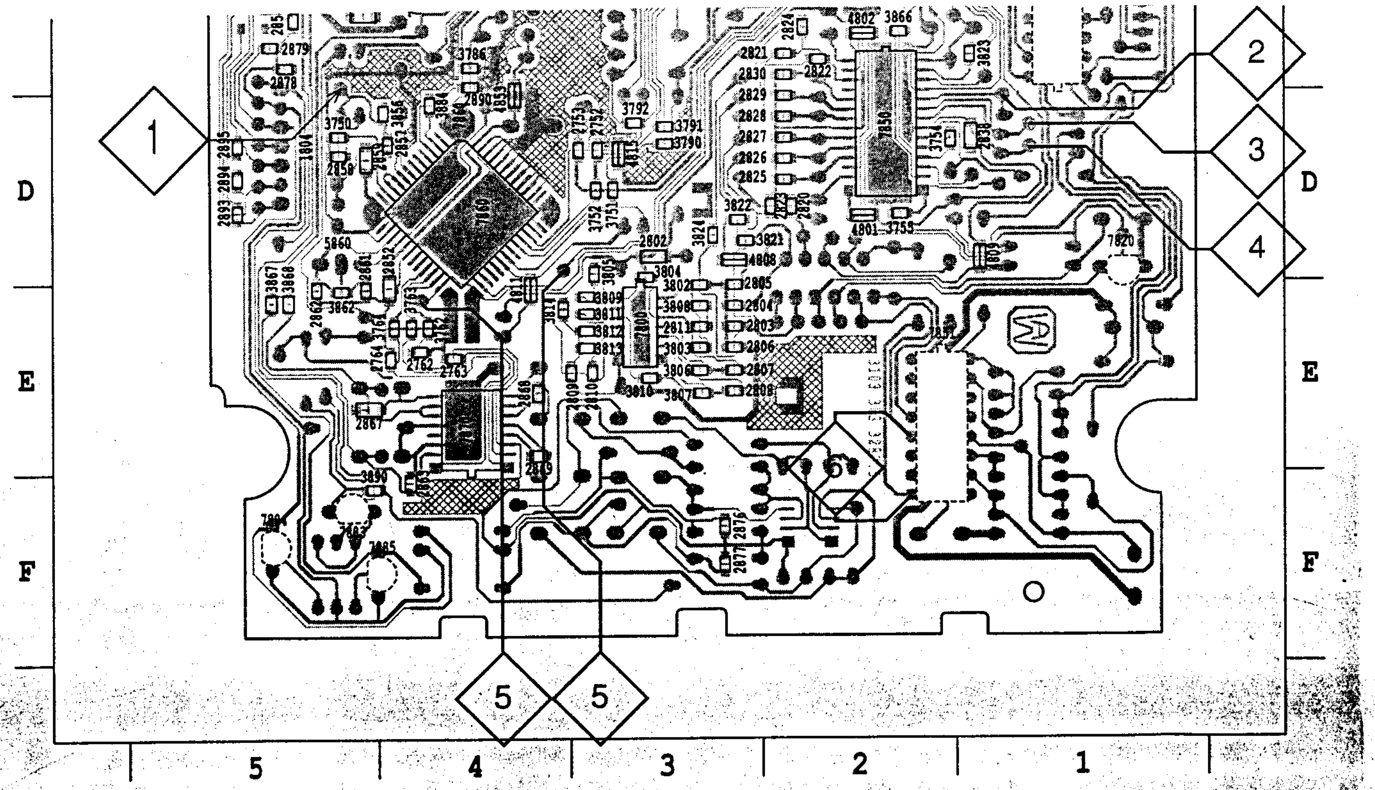

7870
TDA1549
FIR
Control
D/A Converting
Ref. Source
DAC
DATA
WS
CL
LEFT
RIGHT
2769
2770
3767
3770
7885 BC337-40
7884 BC337-40
MUTE
GNDA
BC558B 7883
BZX79 C3V9
CD LEFT
GNDA
CD RIGHT
RESET
ACKN
STROBE
DATA
TO / FROM FRONT BOARD
GND
+CD
FROM POWER BOARD
7886 7805
1N4148
STBY=H
7856
7881 BC858B
FCR4.0MCT
Mute

Figure 1. Portion of Circuit Diagram


1
2
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1

Figure 2. Portion of Chip Layout

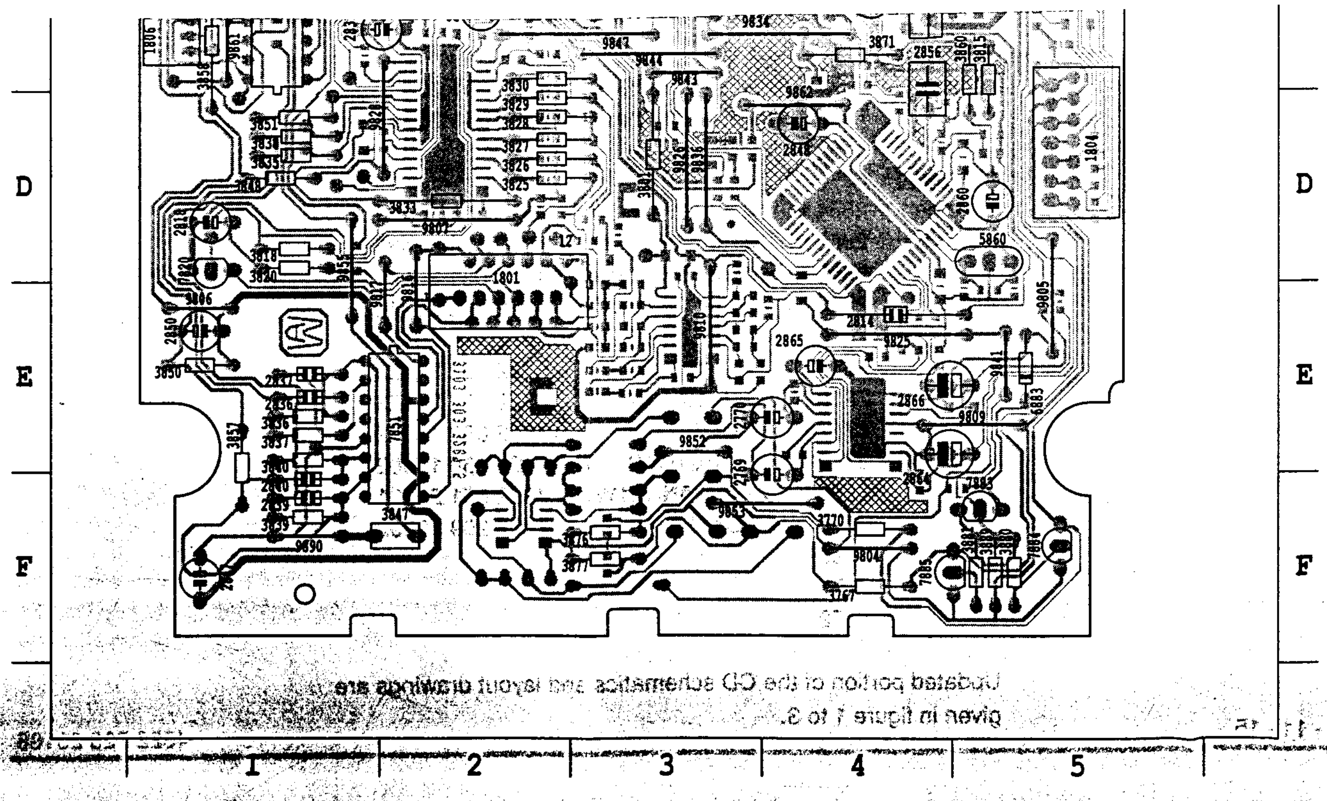

Figure 3. Portion of Component Layout